



# COAL AGE



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No. 9

## If I Were a Coal-Mine Official—III

I WOULD concentrate my attention on mining and selling coal, for human encyclopedias seldom capitalize their peculiar genius. Doing one thing well is the biggest job any man can tackle. I would know what my neighbors and the industry at large are accomplishing.

I would remember that not one man in a hundred can think as clearly and act as wisely when misfortune is imminent as when the sky is clear. Pinch-hitters are rare. The way to avert trouble is to catch it coming and prevent its arrival. Wise men today have a physical examination while they're well. Wise managers call in a doctor for their mine before an ailment is evident.

I would give every man a careful hearing or defer seeing him until I could pay him attention. Courtesy is the chief lubricant between humans. The best thing that can be said of a boss is that he can be reached. Those officials who think to safeguard themselves, their position and their dignity by a self-sufficient isolation have adopted defensive artillery that will kick worse than it will shoot.

I would not seek excuses for my weaknesses. Somehow or other excuses seem to emphasize one's shortcomings. I would spend more time trying to discover my limitations than in figuring out my capacity. Men hate to be the objects of charity—I would have it understood that all my actions were based on justice, not on benevolence.

*MINE officials who have attained some measure of success seldom exercise the same degree of endeavor to maintain their high position that they employed to get it. It's a dangerous thing to think you're on velvet.*

I would not look for favors but would expect to pay for everything I received. I would not bank on friendship and then I would not be disappointed. It is harder to receive handsomely than to give handsomely, and it is still harder to be the recipient of a favor without expecting an encore.

I would be as decent and polite to my office boy as to one of the directors of my company. It is quite an accomplishment to be able to conduct one's self toward superiors in a way that will preserve your self-respect and toward inferiors in a way that will not break down theirs.

I would remember that nothing more quickly wrecks some men than success. When the game is young and the score is a tie, we play hard and carefully; but when we have won and feel secure, diligence and personal efficiency too often disappear. We forget the thousand men who are crouching in the shadow watching our every move while we are floundering half blinded by the limelight.

I would never permit myself to feel that I could afford to lose a friend. Momentum from past victories will carry one only so far. I would realize that the attitude of any management is reflected in the men. A gruff, discourteous boss is evidenced by impudent, unobliging employees.

[To be continued the first issue in April.]

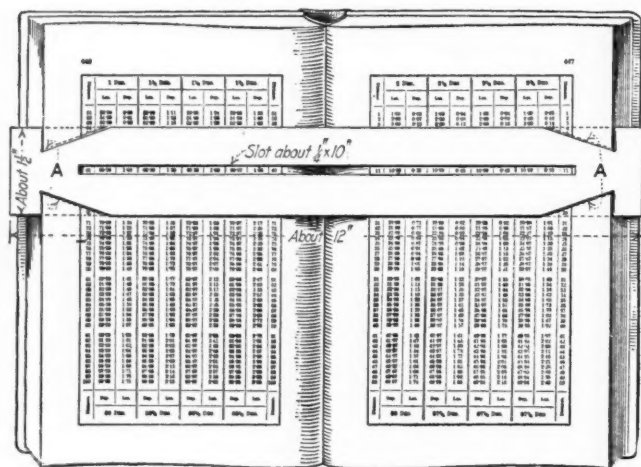
## Ideas and Suggestions

### Indicator for Tables

BY T. EDWIN SMITH\*

I have used the instrument described below to a considerable extent in taking data from traverse tables and have found it a great help. It can be made out of a piece of cardboard, although a strip of celluloid would be better.

The construction is clearly shown by the illustration. In operation I open the book at the page desired and insert a couple of leaves on each side under the points



SIMPLE DEVICE TO FACILITATE TAKING DATA FROM TRANSVERSE TABLES

marked A at each end. In this position the runner can be slipped up or down the page and readings across the page can be secured without any chance of reading the wrong line.

The slot can be made the proper width to show only one row of figures, although it is better to have it a little wider because few books open perfectly straight and the lines on the two pages are rarely exactly opposite and parallel. Although intended primarily for traverse tables, this instrument is useful for reading other tabular data.

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### Belt-Cost Estimating Chart†

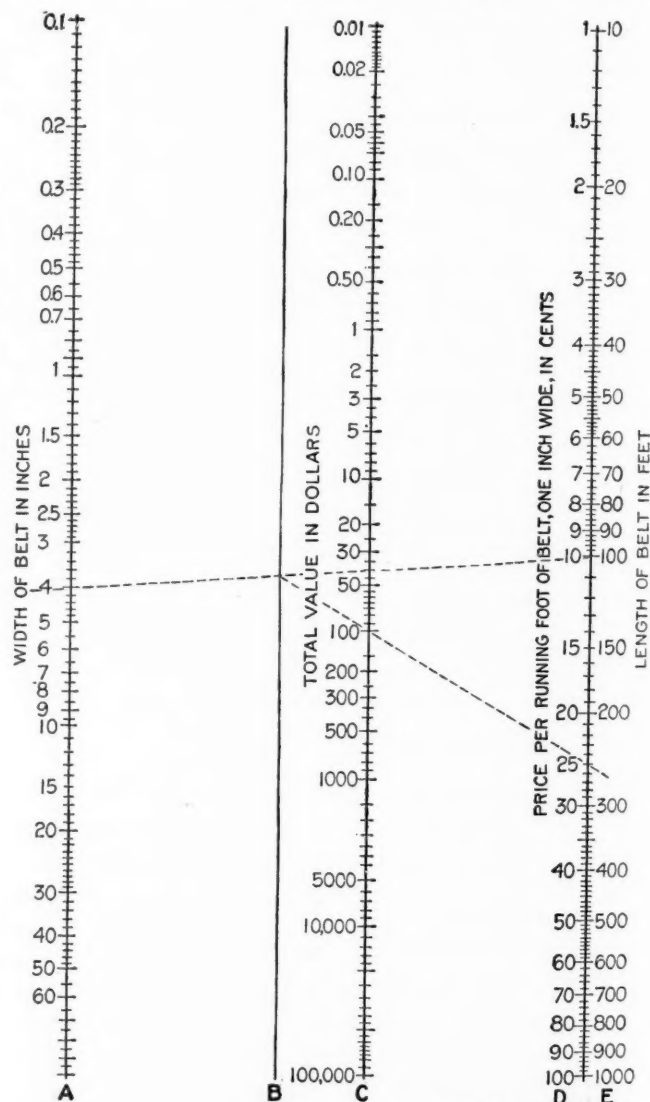
On account of the fluctuating cost of belting it is difficult to keep a price list up to date, and by reason of the fact that belt widths vary so widely and lengths are seldom the same, a different calculation is necessary for almost every drive and at least for every item. To assist the belt user, the belt buyer and the belt salesman, I have therefore developed this chart, for when using it the only price the buyer or salesman has to bear in mind is the price per running foot of belt 1 in. wide (see column D), which I call the *unit price*.

\*Carmangay, Alta., Can.

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For example: What is the total value of a belt 4 in. wide and 100 ft. long, the unit price being 25c.?

Connect the 4 (column A) and the 100 (column E) and find the intersection with column B. From the point of intersection run over to the 25c. (column D), and the answer or *total value* (\$100) is found in column C.



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A CHART TO FIND THE COST OF BELTING

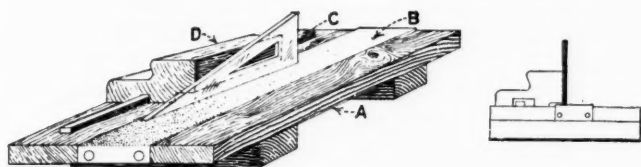
Thus, all one needs to do is to lay a straightedge across the chart twice and the problem is solved.

This chart is based upon the fact that the price of belts generally varies directly with the width and directly with the length. It is not absolutely accurate, of course, because it does not give fractional dollars or cents, but for the estimator it does the work accurately enough and will be found handy for checking pencil figures and "long-hand" methods. A trial and everyday usage will convince the user that it is "pretty close." The range of the chart, it will be observed, is very wide—wide enough for nearly every problem that ever confronts the buyer or seller.

## Truing Worn Triangles

If there is a job that most draftsmen hate to tackle, it is truing up the edges of a worn triangle, whether it is of wood or transparent composition.

The rigging shown in the sketch from the *American Machinist* has been devised by P. P. Fenaux to obtain an edge square with the faces and straight for



TRUING WORN TRIANGLES

its whole length. On a board *A* approximately 8x8 in., of well-seasoned hardwood, strongly reinforced to prevent warping, are tacked a strip of fine sandpaper *B* and a guiding rod *C*. The hardwood block *D* has its side perfectly square with the bottom and is shaped to fit the hand; the bottom is recessed to allow the triangle to travel over the sandpaper and is grooved with large clearance over the rod *C*. The operation is evident.

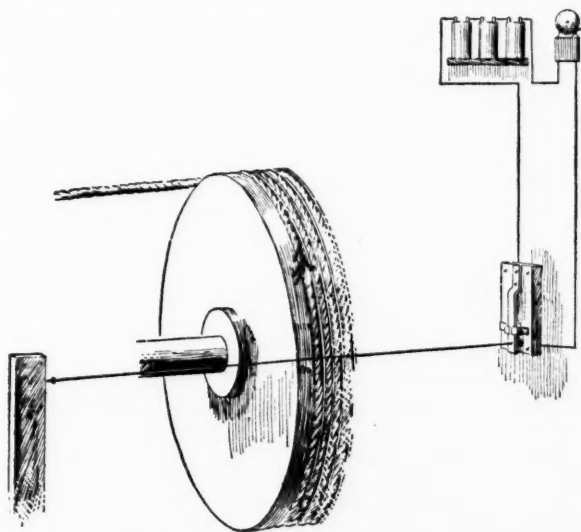
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## Alarm Signal for Transmission Ropes

By M. HAYES\*

The signal here illustrated is at the present time in use at the coal washeries of the Tennessee Coal, Iron and Railroad Co., Pratt Division. It was installed about 18 months ago.

The device has been instrumental in preventing breakdowns and has many times saved the company the cost of a new rope. It does not prevent the rope from breaking, but it sounds an alarm as soon as the first strand begins



TELLTALE FOR STRANDED ROPE

to ravel out. When the alarm is heard, the machine is stopped and the rope repaired, which takes about 15 or 20 min. If the repair is not made immediately and the rope is permitted to run 5 or 10 min. longer, the rope would be in such a condition that it would have to be replaced by a new one.

\*Birmingham, Ala.

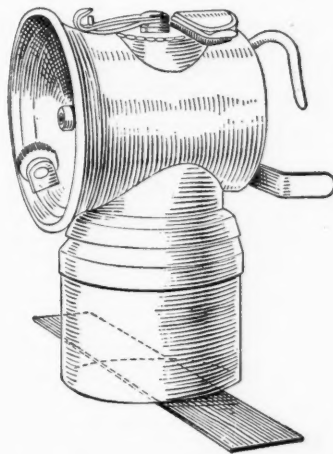
The signal bell that is part of this alarm is placed in the engine room, the trouble catcher being placed near the sheave wheel, tacked up on the side wall or on posts. The trouble catcher is first put in position on one side of the sheave. A piece of wrapping twine runs from the copper spring of the trouble catcher, passing just behind and parallel with the face of the sheave and fastening to a nail on the opposite side. As soon as one of the cable strands begins to ravel out, it strikes the spring and breaks it. The copper spring then makes an electrical contact and the bell rings until it is cut out. When the broken rope is repaired, the spring is again placed in position and the current again turned on.

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## Lamp for a One-Handed Man

By GEORGE N. LANTZ\*

Last fall a pumper in one of the local mines had his arm caught in a belt, and as a result of the accident his arm was taken off. When he was ready to go to work again he began using an oil lamp, for he couldn't handle a carbide lamp as he had done before the mishap. A special carbide lamp that he could use was made for him by a local hardwareman, who riveted a light piece of



CARBIDE LAMP FOR ONE-HANDED MAN

metal across the bottom of an ordinary lamp and soldered it over. When the metal piece is placed in a switch frog the pumper is able to unscrew the top, fill the lamp and replace it with his one hand.

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**To Find the Number of Employees Engaged at a Mine** the total number of shifts of all the men should be added together and the result divided by the number of working days, said A. H. Fay at the National Safety Congress. The difficulty, he found, was that this would involve no little labor for the person making the returns. Another difficulty, not mentioned by the speaker, is to be found in the fact that not all the men who are credited with production on the payroll mined it on the day of credit, for it may have been mined one day and weighed the next, or it may have been loaded out by the buddy working alone. Mr. Fay suggested that if the averaging plan proved impossible of attainment, a single day might be chosen each month as a basis of estimation. The present method, he said, tended toward an overestimate of the men employed and an underestimate of the fatality and accident rates.

\*New Straitsville, Ohio.



# The Pendulum Hanger for Shaker Screens

By JOHN A. GARCIA\*

**SYNOPSIS**—Supporting a shaking screen on hangers of such length that its number of oscillations per minute when swinging free as a pendulum is approximately the same as the speed at which it should be driven in order to properly screen the coal, results in a great saving in driving power. The vertical component of the motion given the screens is of material aid in the screening process.

The remarkable results obtained from half a dozen installations of pendulum-hung screens during the last year by the Allen & Garcia Co., of Chicago, the firm that con-

\*Chicago, Ill.

trols the patents, promise to bring about radical changes in shaker-screen design. Now, that this device has been thoroughly tested under most severe operating conditions at speeds ranging from 90 to 110 r.p.m., on main shakers sizing mine-run coal at the rate of 400 tons per hour, re-screener shakers at 125 to 150 r.p.m., 300 tons of small coal per hour, and loading or degradation screens under bins at 150 to 180 r.p.m., it is probably safe to state that the pendulum hanger is a proved and successful invention. A description of it, therefore, should be of interest to all coal-mining men.

The pendulum hanger is the invention of O. G. Petersen, of Somerset, Ky. Patent papers No. 1,185,433 give a full and complete description of this device, but the following excerpt from the patent explains the most important features:

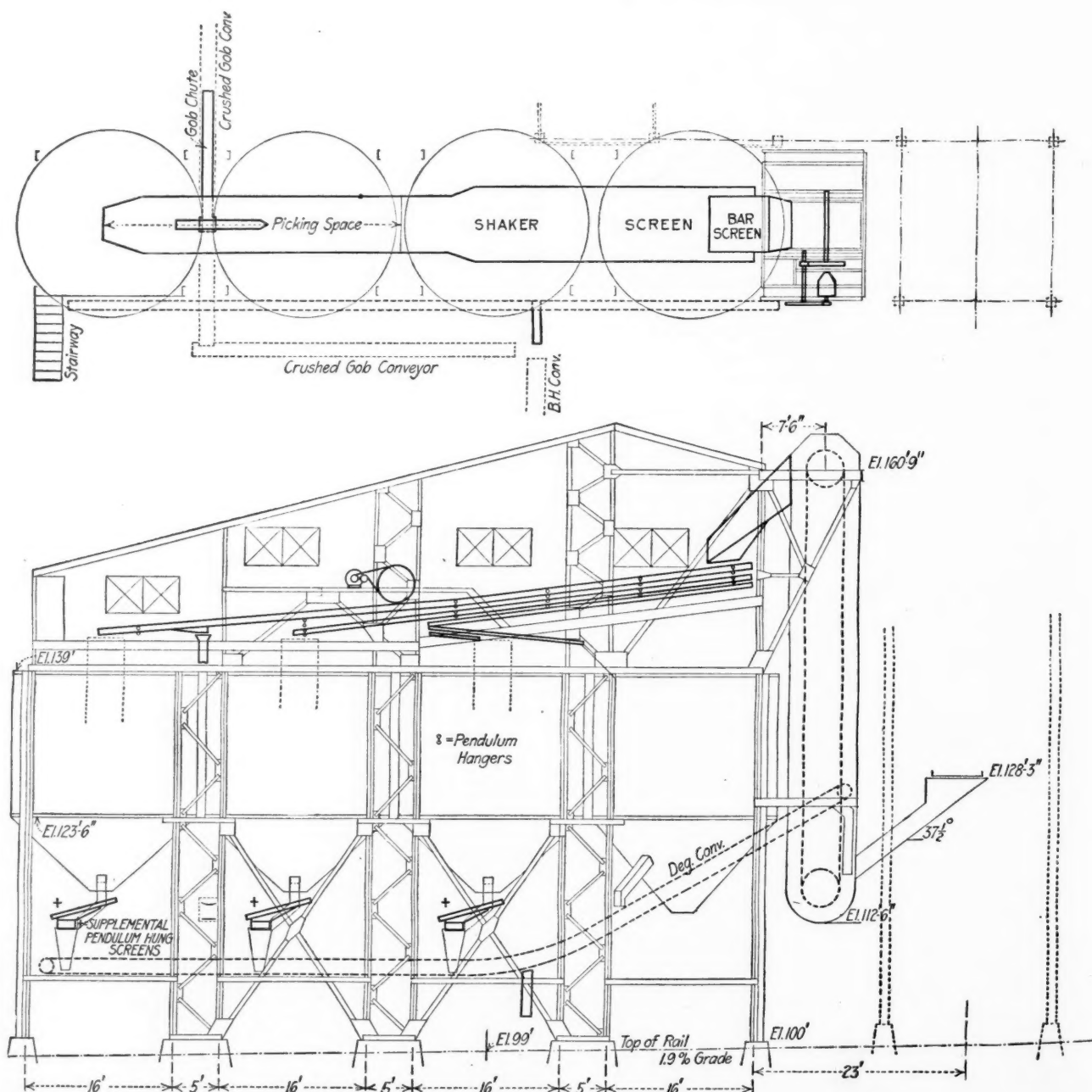


FIG. 1. PENDULUM HUNG SHAKING SCREENS USED AS PICKING TABLES





The inclination of the screen is also a factor in the correct design, but it is possible to operate the shaker horizontally by setting the point of screen suspension a little ahead of the vertical, so that the coal moves only on the forward stroke except for the vertical throw which keeps the perforations clear. This feature makes it possible to use the screens as picking tables. Thus the shakers in the Christopher Coal Mining Co.'s rescreener (Fig. 1) have been flattened at the lower end so that the nut coal can be hand picked before it reaches the bin. However, on tipple screens it is not advisable to use the screens as picking tables because of the difficulty of picking large lumps



FIG. 4. PENDULUM HANGERS AND STANDS IN TIPPLE OF J. K. DERING COAL CO.

on any surface having a reciprocating motion, the danger of smashing fingers and the useless waste of power in running large screens horizontally and neglecting gravity.

The large tipple screens for the new tipple of the Chicago, Wilmington & Franklin Coal Co. at Thayer, Ill. (Fig. 2), have now been in operation about six months handling mine-run coal at the rate of 400 tons per hour. These screens are equipped with  $7\frac{1}{2}$ -in. roller-bearing pendulum hangers driven by a  $4\frac{1}{2}$ -in. crankshaft at 110 r.p.m. The following data on power consumption are from tests made by the coal company's engineer.

Voltage—D. C.—275 average.

Running light, minimum 15 amp., maximum 30 amp.

	Amp.				
Running loaded, 5-min. interval readings = 25	25	25	20	25	25
Running loaded, 1 min. interval readings = 20	15	25	20	20	20
Running loaded, 1-min. interval readings = 25	25	20	25	25	20

Assuming maximum amperage for loaded screens, 25 amp.  $\times$  275 volts = 6.88 kw. input;  $6.88 \div 0.746 = 9.2$  hp. input;  $9.2 \times 0.8$  (80 per cent. motor efficiency) = 7.36 hp. output.

This is about 25 per cent. of the power usually required to operate a large shaker screen sizing 400 tons of coal per hour.

Fig. 3 shows a supplemental screen used for rescreening small coal. It is operated by a 3-hp. motor. This screen swings on pendulums at a normal rate of 150 r.p.m., but it is often speeded up to 240 r.p.m. to permit the quick loading of cars. The steep inclination of these screens, their high speed of operation and the upward thrust given the coal combine to make an absolutely clean product. There is no dust or undersize coal whatever in the nut or pea after leaving the screen, even in the No. 4 ( $\frac{3}{4}$  to  $\frac{3}{8}$  in.).

This supplemental screen can be installed at small expense under practically any existing coal bin. When properly designed it will make perfect preparation of any size, even as small as No. 4 pea, and permit of 50-ton cars being loaded out in 12 to 15 min. In fact, cars have been loaded out in 6 min. by speeding up the screens. The use of a shaker of this type under the bins makes it unnecessary to size the coal perfectly on the larger shaker or the rescreener, and if the coal in an existing plant is poorly prepared, excellent results can be obtained at small expense by installing the small pendulum screen at the outlet points without reconstructing the larger screens, as would otherwise be necessary.

The pendulum hanger also permits of using a single-leaf screen without cumbersome counterbalance. This means, among other advantages, that little headroom is required and that small space is necessary for its installation.

Fig. 4 shows the pendulum hangers and stands as they are installed in the new tipple of the J. K. Dering Coal Co., Clinton, Ind., and gives an idea of the heavy stand construction. This view along the screen shows clearly the method of suspension.

The cost of a pendulum-screen installation in a new steel tipple is about the same as the cost of an outfit equipped with well-built rollers, or one suspended from a superstructure, since the entire load can be carried direct to the main girders through the pendulum supports. All steelwork above the walkway may be of light members designed to carry the covering load only. The installation cost is low and the maintenance practically nothing, as the pendulum motion naturally tends to reduce wear and shock.

Pendulum hangers can be placed on almost any existing screen equipped with rollers or long hangers, and the cost of the change can be saved in a short time by the great saving in power consumption.

The Allen & Garcia Co. has secured exclusive rights for the pendulum hanger from O. G. Petersen and has decided, after subjecting the invention to severe tests in actual operation, to adopt this hanger as a standard and use it as such in all future installations.

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**Government Specifications Provide for the Collection of "special moisture samples" if, in the opinion of the officials sampling it, the delivery contains moisture in excess of that guaranteed by the contractor. The "special moisture samples" are prepared in a manner to minimize moisture losses and may be taken and prepared independently of the gross samples collected for the determinations of heating value (B.t.u.), ash and other specified data. If the analysis of the special sample shows a moisture content in excess of the contractor's guarantee, a proportionate deduction is made from the price to be paid for the coal.**



## Scientific Methods of Coal Buying—II

BY JOHN B. C. KERSHAW

*SYNOPSIS—This article takes up the sampling and analysis of the coal. One of the first and most necessary requirements is an intelligent and thoroughly reliable sampler. A description is given of the various methods of crushing, grinding and reducing. Determination of the moisture content.*

It is an accepted truism that the sampling of any commercial product is quite as important as the analysis of the sample obtained. If the sample is badly taken, and therefore is not representative of the bulk of the product, from the commercial standpoint, the results are valueless.

It is necessary, however, to repeat this caution when writing upon the subject of scientific standards of coal valuation. Part of the suspicion with which the new system is regarded by colliery men is attributable to the faulty and slipshod methods of sampling that have been adopted in the past, and to the unfair valuation of the fuel based on the test results, obtained in these cases.

The sampling of a 100- or 1000-ton delivery of coal requires to be carefully carried out, by a properly trained man, in accordance with certain definite rules if the sample finally obtained is to be representative of the whole delivery. The widely prevalent idea that any man armed with a shovel can sample coal must be eradicated before much progress, along the lines of scientific valuations, can be made. The objection urged against employing properly skilled men for sampling coal is, of course, that of expense. If the thing is to be done at all, however, it must be well done; and the saving effected by employing unskilled labor for sampling coal is negligible when compared with the amount of money involved.

Naturally, there comes a point in the purchase of fuel when the cost of sampling and testing is too heavy in relation to the value of the coal bought to render the system economical or practical. Every fuel contract over 100 tons, however, carries enough value to pay for sampling and testing, and if the cost of the latter be divided between all the parties to the contract, it is too small to be of any importance.

A skilled and trained sampler with two or three unskilled laborers, and proper equipment, can control the regular sampling of 1000 tons of fuel per day and, if necessary, could look after the interests of two or three purchasers at the same coal yard. The man selected as boss of the gang, however, must be well paid; for the work is of great importance and demands a high degree of intelligence. Professional samplers also have more need of strong character and moral backbone than the ordinary man, since attempts to bribe them to betray their employers' interests are customary and very often successful. A good, honest sampler is therefore well worth his wages and should be treasured by his employers when once found.

### METHODS OF COAL SAMPLING

The fundamental principle or aim of all sampling is to obtain a final portion of the material to be sampled which shall be thoroughly representative of the original car, truck, load or heap of fuel. This can only be secured by the exercise of great judgment and care in the samp-

ling work. There are three conditions which must be observed in order to obtain a fair sample of fuel containing both large and small lumps:

1. The original sample taken must be large enough to represent all portions of the bulk, and a fair proportion between large and smalls must be maintained.

2. The sample must be reduced by repeated crushings, mixings and quarterings to the small quantity required for the actual test.

3. In order to continue the crushings and quarterings up to the required degree of fineness, it is necessary to dry the sample at some intermediate stage. A wet or damp sample of fuel cannot be ground to pass through a 60-mesh brass wire sieve, which is that used for the final stage of fuel sampling.

When coal is sampled at the face of the seam in the mine, a comparatively small sample of say 1 lb. will be sufficient to represent the bulk. Samples taken in this way, however, are always more free from ash and yield a higher calorific value than those taken from the same coal as shipped, since in the act of mining the coal a portion of the shale and clay that accompanies the coal seam is brought away with it. Colliery samples and tests of fuel are therefore always rather better than those of the buyers', and if coal is bought on the strength of such tests, due allowance must be made for this difference.

When coal is shipped and samples have to be collected from cars or barges, a much larger sample, varying from 600 to 1500 lb., will be required. It must also be remembered that the jolting of a railway car will send the small coal and dust to the bottom. In a barge the finer coal and smalls are found most generally in the center of the cone-shaped pile or heap of fuel under each hatch, and the large lumps are found round the base of the conical heap. In neither case, therefore, can a fair sample be obtained by merely taking a shovelful from various parts of the top of the car, or outside of the heap. It is only on discharge of the fuel that a fair sample can be obtained.

G. S. Pope, in Bureau of Mines Bulletin No. 63, on the "Sampling of Coal Deliveries," gives the following directions concerning the collection of gross samples of American coals:

When coal is being unloaded from wagons, railroad cars, ships, or barges, a shovel or a specially designed tool may be used for taking portions or increments of 10 to 30 lb., to make up the gross sample of coal. As the size of the increments should be governed by the size and weight of the largest pieces of coal and impurities, increments of more than 30 lb. may be required for coals containing large pieces of coal and impurities.

The portions should be regularly and systematically collected, so that the entire quantity sampled will be represented proportionately in the gross sample. The interval at which the portions are collected should be regulated, so that the gross sample collected will weigh not less than approximately 1000 lb. If the coal contains an unusual proportion of impurities, such as slate, bony coal and pyrites, and if the pieces of such impurities are very large, it will be necessary to collect gross samples of even 1500 lb., or more; but for slack coal and for small sizes of anthracite, if the impurities are not in abnormal proportion or in pieces larger than about  $\frac{3}{4}$  in., and if the impurities are evenly distributed throughout the coal, a gross sample of approximately 600 lb. may prove sufficient. The gross sample should contain the same proportion of lump coal, fine coal and impurities as the coal delivered. As the portions are collected they should be



deposited in a receptacle having a tight-fitting lid provided with a lock.

A gross sample taken by hand from coal delivered by wagon at a Government building, should consist of shovelfuls of coal taken from every first, second or third wagon load as it is being discharged, the number of shovelfuls taken and the loads sampled being dependent on the number of loads which the gross sample is to represent. If the coal is discharged immediately into a crusher, it is preferable to collect shovelfuls of the crushed coal.

Samples taken from railroad cars should not be limited to a few shovelfuls of coal procured from the top of a car, for the size of the coal and the proportion of foreign matter may vary from the top to the bottom of the car. The only way to obtain a representative sample is to take a number of shovelfuls or portions of coal from different points in a car, from top to bottom and from end to end, while the coal is being unloaded.

In sampling cargoes, as in sampling carloads, portions of coal should be taken in equal quantities and at frequent and regular intervals, so as to represent proportionate parts of the consignment as a whole; either while the coal is being loaded or unloaded. There is no assurance that a sample or a series of samples taken from the top of the cargo represents the cargo as a whole; in fact, it is very doubtful if such samples are ever representative.

The crushing, mixing and reduction of the sample to a smaller bulk may be either carried out by hand or by crushing machinery. Where a

$\frac{1}{4}$ -in. sieve. Two 2-lb. tins, with patent lids, are filled from this remaining heap of fuel, after thoroughly mixing the same with the hands or with a small shovel.

Pope, in the bulletin already quoted, suggests the following scheme of crushing, for samples treated by hand:

Weight of Sample to Be Divided	Size to Which Coal and Impurities Should Be Broken Before Each Division
1,000 lb. or more.....	1 in.
500 lb. ....	$\frac{3}{4}$ in.
250 lb. ....	$\frac{1}{2}$ in.
125 lb. ....	$\frac{3}{8}$ in.
60 lb. ....	$\frac{1}{4}$ in.

As regards mechanical crushers, I make use of the small crushing mill illustrated in Fig. 1 for samples containing lumps up to 2-in. cube, and have found this quite satisfactory. It can be operated either by hand or electricity and crushes to a fineness of  $\frac{1}{16}$  in.

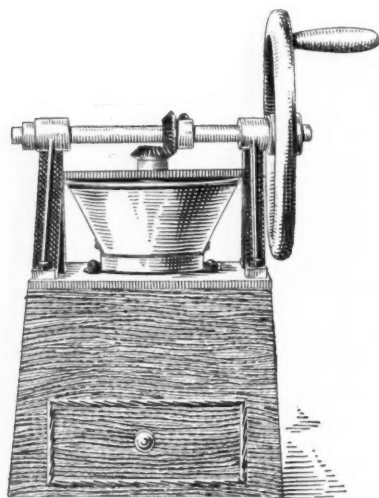


FIG. 1. A TYPE OF SMALL CRUSHER

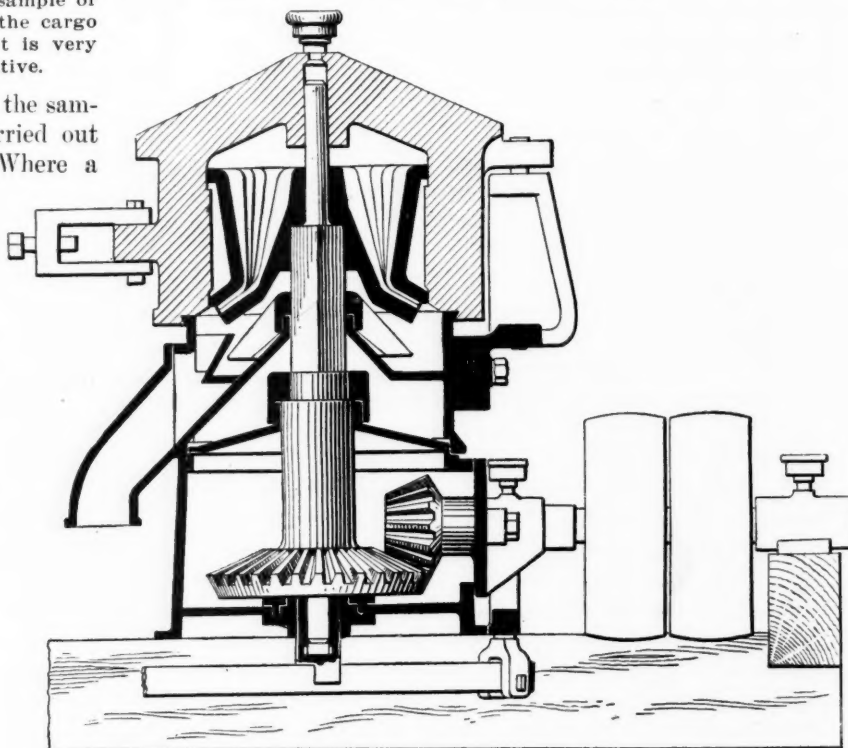


FIG. 2. STURTEVANT AUTOMATIC CRUSHER AND SAMPLER

large number of samples have to be dealt with, some form of mechanical crusher is essential.

#### CRUSHING, MIXING AND REDUCTION OF SAMPLE

In small works and boiler houses, where no mechanically operated crusher is available, I recommend the use of the following method:

At the end of the day, or period for which the sampling is to be carried on, the heap of fuel obtained for sampling purposes, as described above, is transferred to a sampling plate, and the larger lumps are all crushed down to walnut size. Should no sampling plate be available, four of the iron plates used for covering manholes and boiler flues may be utilized to obtain a hard, clean surface on the floor of the boiler house, and the crushing down of the sample may be carried out on these plates, with any heavy and flat lump of iron at hand.

The heap of fuel, after this first crushing, is thoroughly mixed by turning over and over with a spade. It is then flattened down, two lines are made across it at right angles with the edge of the spade, and two of the four opposite sections are selected to form the reduced sample. The lumps in this are again crushed, the sample is again mixed, and the quartering operation repeated, until about 8 or 10 lb. of fuel only remain, with no lumps that will not pass through a

This mill, however, is not adapted for dealing with samples of more than 28 lb. weight, and for larger quantities the automatic crusher and sampler brought out by the Sturtevant Engineering Co. may be recommended. This crusher is illustrated in Fig. 2.

The coal is fed into the hopper in 3-in. pieces or finer. It is first nipped by the top crushing members and is subjected to gradual reduction, until discharged at the periphery below. A sample spout is placed opposite the discharge opening and is arranged to remove a certain percentage of the product, 5, 10 or 15 as the case demands. The sample thus secured is exactly representative of the whole, including the slate, sulphur, or other impurities.

As the illustration shows, the machine is simple, massive and compact, and amply strong to crush coal and all the impurities that occur in it. The machine runs at a slow speed without vibration on any floor, and can be instantly adjusted for fine or coarse work while in operation, by simply turning the handwheel. It may be set as fine as  $\frac{1}{4}$  in. or as coarse as  $\frac{3}{4}$  in., and delivers a uniform product.

The final sample of fuel after the operations described above, should amount to about 8 lb. in weight and must contain no lumps that will not pass through a  $\frac{1}{4}$ -in. mesh sieve. It is well mixed with a small shovel or scoop, and three 2-lb. tins with patent lids are then filled from it. These form the laboratory samples and must be kept in a cool place until opened for examination and test. Each sample tin should bear a label giving full particulars of the date of sampling, the origin of the fuel and any other information regarding it that may be necessary for proper identification. In cases where a large number of samples are being dealt with at the same time, considerable care is necessary to prevent confusion of the samples, and the use of written labels is all the more urgent. For testing purposes, the samples may be marked simply A, B, C, etc., if the original sample tins bear corresponding letters, in addition to the full details as to the fuel and date of sampling.

#### FURTHER REDUCTION OF THE SAMPLES IN THE LABORATORY

The 2-lb. samples of fuel when opened in the laboratory are first passed through a  $\frac{1}{2}$ -in. mesh sieve, and the portion of the sample that remains on this sieve is ground down to a finer state of subdivision by aid of a No. 3 Kenrick mill, shown in Fig. 3.

If the fuel is very wet, or if the sample contains many pieces of shale, this more direct method of preparing the sample must be modified to meet the circumstances. The excessive moisture can be removed by spreading out the whole of the sample on three or four thicknesses of newspaper and by leaving it exposed to the air for several hours in a warm corner of the laboratory. Very wet samples should have the uppermost sheet of the paper removed two or three times, as newspaper is very absorbent and takes up much of the moisture from the fuel. It is also well to mix and turn over the fuel several times during this air-drying.

As regards the larger hard lumps of shale in the 2-lb. sample, these should be picked out and crushed in the steel mortar used for the final grinding of the fuel sample, since if these lumps are very hard they may break the grinding teeth of the mill or become jammed in it. Care must be taken that none of the pieces of shale are lost during the breaking down in the steel mortar, for shale possesses no heating value, and the proportion of it present in the final sample has considerable influence upon the heat value of the fuel. For this reason, the steel mortar and grinding mill should be covered with a perforated card when crushing shale, as the harder the lumps the greater is the tendency for the pieces to jump out and become lost.

After the preliminary crushing in the mortar, the whole of the shale must be passed through the Kenrick mill, and the ground material be added to the general body of the sample, which will now occupy double the volume of the original sample and resemble a heap of coarse black gunpowder.

The sample is thoroughly mixed by transferring it to a trumpet-shaped tin vessel with the outlet stopped by a cork, as shown in Fig. 4. As the coal is run through this onto a sheet of paper, the funnel is slowly moved around so as to distribute the sample equally on all sides of the pile. The heap is then flattened out and quartered as already described, and another mixing of the two quarters selected to form the reduced sample is carried out with

the aid of the mixing funnel, in the manner described above. This operation is repeated again and again, until only about  $\frac{1}{4}$  lb. of fuel remains. This is divided into two equal portions, one of these being used for the tests and the other reserved in a stoppered bottle until the test is completed, in case of any mishap or mistake in the examination of the first portion of the sample.

The final outcome is two small portions of the fuel in a finely divided state, which are quite representative of the whole bulk, be it 10, 20, 50 or 100 tons. By a further grinding and reduction of one of these samples a small portion of fuel, weighing only one or two grams, can be obtained which will still be thoroughly representative of the original bulk.

#### THE LABORATORY EXAMINATION

All coal contains carbon, oxygen, hydrogen and nitrogen, with sulphur and certain incombustible mineral matters, such as iron-oxide, lime and magnesia. These latter on combustion combine with the sulphur to produce their respective sulphates, and form the ash of the fuel. Moisture is also present, even in mine samples of fuel, chiefly however as a mechanically held impurity.

The chemical examination of a coal sample may therefore cover the determination of the percentages of the



FIG. 3. KENRICK GRINDING MILL



FIG. 4. FUNNEL FOR SAMPLING

elements and compounds above enumerated, in which case the analysis is said to be an "elementary" one; or it may cover the determination of the percentages of the products formed when coal is heated either in a closed crucible or in the presence of air. In the latter case, the analysis is said to be an "approximate" one.

For the purposes of the colliery owner and the purchaser of the fuel, the approximate analysis is much the more useful, since it indicates what proportion of the fuel will escape as a gas when it is first heated, what proportion will remain as coke on the bars of the grate and, finally, what percentage of the total fuel is a mere impurity in the shape of ash. When the figures for the actual heating value of the fuel, as determined by a reliable calorimeter, are added to the results of the approximate analysis, the engineer is provided with all the information he can require concerning the character and value of the fuel.

If the 2-lb. sample has been crushed and reduced to small bulk within 30 min., without recourse to air-drying, the moisture can be determined quite easily by heating 10 grams of the reduced sample in a copper or aluminum air bath at 230 deg. F. (110 deg. C.) for two hours. The loss of weight undergone by the sample in this time, multiplied by 10, gives the percentage of moisture in the original sample, and therefore approximately in the



whole bulk of the fuel. A desiccator must be employed for cooling the sample before weighing, as perfectly dry, finely divided fuel absorbs moisture from the air and gains in weight, even while being weighed on the balance. It saves time, however, if the crucible be allowed to go nearly cold in the air with the lid on, before being placed in the desiccator. On no account must the crucible be placed on the balance pan and weighed while still hot, as this will show an increased weight. The crucible must be covered during its heating in the air bath, and the lid should not be removed while weighing.

In those cases where it has been impossible to carry to completion the repeated crushings and reductions of the sample, owing to the wet state of the fuel, the sample is reduced as far as practicable by hand crushing upon iron plates, and a rough sample of 50 to 100 grams, according to the bulk of the original, is dried by heating in the air bath for four hours at 110 deg. C. The loss in weight of 100 grams of fuel gives the percentage direct, but the results will not be so accurate as those obtained from the smaller sample, owing to the fact that wet or damp coal cannot be thoroughly mixed. For this reason, moisture contents above 6 per cent. are always somewhat unreliable, and if any limit is placed upon the moisture permitted in the deliveries, due allowance must be made for this error.

On the other hand, in hot weather, the coal is losing moisture during the whole sampling and crushing operation, and if this covers a long period of time, the final sample will contain 2 or 3 per cent. less moisture than the coal as delivered.

In those cases, therefore, where the contract arranges for fines to be imposed for excessive moisture, it is necessary to have a special sample taken, and rapidly crushed for the purpose of the moisture determination, following the plan recommended by Pope on pages 29 and 30 of the bulletin already quoted.

[To be concluded]

## Causes for Loading Poor Grades of Coal

An unusually exhaustive analysis of the causes for the occasional shipment of poor grades of coal is embodied in the following correspondence between the sales manager and the mine manager of a large Western coal company. The sales manager wrote as follows:

"We are having trouble because of the quality of coal shipped from our mines to customers. Car M. O. & G. 3064, loaded Apr. 25 at Mine No. 3, and shipped to the R. D. Co., on June 7, contained an excess of dirt and slack. I have a sample of some of this in our office and will be glad to send the same to you if you so desire.

"This was an exceptionally bad car, and we will no doubt lose considerable money as well as some future business on this shipment. Their contention is that it was one-third dirt and slack, which is perhaps a little strong to be true but unquestionably it was a very bad car of mine-run, and I believe you will agree with me in this verdict after you see the sample.

"Car M. O. & G. 3688, shipped May 23, loaded with slack on the order of the C. F. Co., was refused twice at destination by two different customers. It was finally resold by the C. F. Co. at a loss of \$20.82.

"Car M. O. & G. 3837, nut mixture, shipped May 13 from No. 3 mine to L. on the D. C. & C. Co.'s order, was refused at destination; this car, as well as 3064, was examined by our man. There is a charge of over \$100 against this company on 3837, after the same was resold on account of being refused by different customers.

"I would be glad to have your version of the quality of the coal above referred to, and wish to say that we have had considerable complaint on other shipments though we got by without any special refund. This especially applies to No. 3 mine."

The reply ran as follows:

"Your very interesting communication at hand. No doubt there are numerous complaints of this kind in the present state of the trade and weather.

"If you will refer to the record of operation of No. 3 mine, to which you make special reference, you will find that it suspended operation Feb. 15. Listed below you will find a record of the idle and working days from Feb. 15 to date.

Operation Suspended	Operation Resumed	Number of Days Idle
Feb. 15	Mar. 6	19
Mar. 7	Mar. 16	8
Mar. 17	Apr. 3	16
Apr. 4	Apr. 17	12
Apr. 18	Apr. 25	8
Apr. 26	May 9	12
May 10	May 23	13
May 23	May 29	5
May 30		23 to present date

"In other words, the number of days worked amounts to 15, counting part days; the idle days number 114, or an average of about one day of work to eight days of idleness. During the idle period, falls of rock would accumulate in the working places, not in large quantities perhaps, but a constant dropping of small particles that the miner, even should he be so disposed, would find impossible to separate in its entirety from the coal. This accounts for the unusual amount of small foreign matter mixed with the fuel. The large chunks were, of course, removed and we went to extra expense to remove what we could from the nut coal. At the end of the second day's work, when a miner had made a good impression on his 42-ft. place, the run was off for 16 days, during which time the accumulation of dirt and water was going on.

"The effect of accumulated water is equally damaging. The water is removed on idle days from the sumps and places to which the pipe lines extend. In every mine there are numerous working places that have no water to speak of when the mine is in continuous operation, but in idle times accumulations occur. This water frequently exists only in quantities sufficient to thoroughly saturate the coal, which is not entirely loaded out in the two days' work. When the mine again stands idle for 16 days there is a repetition of the performance.

"This water causes the small particles of coal to screen entirely different from the way they do during the normal operation of the mine, the dampness causing them to cling together or to the larger lumps. This puts slack coal below its normal standard, also brings it into the nut coal and puts slack and nut in the lump. The accumulation of dirt, as mentioned above, increases the amount of foreign matter. The wet coal does not have the glossy, snappy appearance the dry coal has and furthermore, owing to the comparatively small number of days worked and the length of time that elapsed before the sales department was able to make disposition of the



loads, the lumps in many instances had been removed from the top of the cars by coal thieves, and the coal itself through the long exposure to the weather had disintegrated.

#### MISTAKEN POLICY OF SALES FORCE

"To sum the matter up, it is impossible by working one day in eight to prepare our uniform standard grade of coal. I think that in trying to sell this indifferent grade of coal during the idle season and represent it as our finest guaranteed grade you are guilty of a great wrong. The policy of the sales force has had more to do with causing these unfortunate and expensive troubles than has the impossibility of standard preparation.

"The sales force should be thoroughly acquainted with the quality of coal produced and should adjust the sales policy to the grade we are producing. They should not try to sell the poor production during the idle season in the same way they would sell the higher grade of coal during the busy season, as there is a marked difference in the demand, a difference in the product and a tremendous difference in the attitude of the buyer. The salesman who can adjust his methods of presenting his proposition to the buyer, and who can intelligently follow the changes in the market and the variations in the quality of his product and give heed to the numerous apparently trifling things that are influential factors in successful selling, is the man who will establish a high place for himself in the mining industry and deserve the eternal gratitude of his employers.

#### THE LAST ACT

"You say you have a sample of coal from the run-of-mine car that was refused and would be pleased to show it to me. In reply I will put myself in the man's place who made the adjustment.

Scene, railroad track —; leading characters, irate buyer and an explanatory salesman.

Salesman, with pleasant smile: "Well, well, Mr. Buyer, how are you this morning? Isn't this beautiful weather? (Warm handshake by salesman.) How is Mrs. Buyer and all the little Buyers?"

Irate Buyer (who thinks he can cut the price substantially): "All well; but what I want to talk to you about is this blankety blank blank car of alleged mine-run coal. Why, it looks like it was loaded out of the slate pile and some slack dumped on it."

Salesman (conciliatingly): "Possibly the car might be a little off from our usual high standard, but (with visions of loss of future orders and the boss' wrath) we are willing to make any reasonable adjustment," etc.

"Adjustment finally made with salesman sweating blood; how shall he square himself? Why, very easily. (A brilliant thought.) The coal was rotten, the worst he ever saw. He finds a little dirt at one end of the car and, lucky dog, there is three handfuls at the other end. This combined with some slack will positively prove to that low degraded operating department that their preparation is awful, so awful in fact, that not even a high-grade salesman, like himself, can get by with it.

"It might be well for the sales force to bear in mind that the present output from the narrow places at two of our mines is smaller coal than we usually get from

these mines, though so far as dirt is concerned the coal in both mines is as usual. It must be borne in mind that we cannot keep a man on cleaning all the time, and also of the psychological effect of warm weather upon the buyer."

✽

#### A Fairly Profitable Year

A year of abnormal industrial conditions, in which the higher cost and the growing unrest of labor were complicating factors, is described in the Lehigh Coal and Navigation Co.'s ninety-sixth annual report, issued recently. The report shows that the 1916 production of coal by the company's mines was 3,654,499 tons, a decrease of 112,203 tons from the previous year, although the production per hour increased 60 tons over that of 1915. This is accounted for by the substitution of an 8-hr. for a 9-hr. day.

After recounting the difficulties which confronted the coal operators during the year, the report continues: "These circumstances, together with the persistent demand for coal, especially during the latter months of the year, and the congested transportation facilities, which prevented the anthracite trade in certain sections of the country from fully meeting the demands of the market, required the continuous and patient efforts of operating officials, harassed as they were by investigations, both Federal and state, to successfully meet the economic conditions imposed."

In spite of all these misfortunes, however, the year was not altogether unprofitable, the financial section of the report making mention of the fact that in 1916 dividends aggregating 8 per cent., or \$4 a share, and amounting to \$2,124,633 were paid.

✽



"If I Only Dared."  
THE SITUATION NEAR THE NORTHERN BORDER AS  
VIEWED BY THE ROCHESTER "HERALD"

# Longwall at a North of England Mine

BY T. GOLDON\*

**SYNOPSIS**—Description of a longwall machine mine in the north of England, with arguments for and against the adoption of the longwall method of operation. At this mine a disk cutter driven by compressed air is used to cut the coal. It undercuts  $4\frac{1}{2}$  ft., with a kerf of only 3 in.

In reply to the Foreword of Feb. 10, calling for a method of working longwall in a 3-ft. seam, with a drawslate which falls readily after the coal is removed, I will endeavor to describe and sketch a method employed successfully at North Walbottle, in the north of England, at which mine I officiated for some time.

This working is 750 ft. deep, and the nearest operated area in the mine is  $1\frac{1}{2}$  miles from the shaft bottom. The seam is 3 ft. thick and has 4 to 6 in. of drawslate. Above this is 15 ft. of sandstone, termed "post cover," because it will come down if not posted. The floor is of fairly hard shale, and the seam rises to the west at about 2 in. to the foot. These conditions are ideal for longwall. The plan, Fig. 4, is divided into two districts, first west and second west, and has about 22 places to each district. The crossgates are driven off the main heading

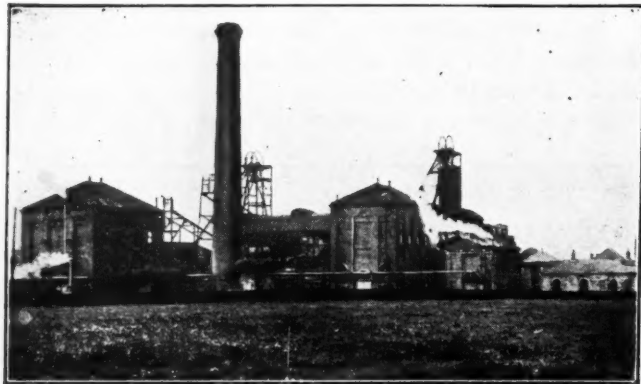


FIG. 1. NORTH WALBOTTLE COLLIERY

every 132 ft. and at an angle of 45 deg. Gateways are driven from these parallel with the main heading.

The gateways are turned off the crossgates every 24 ft. This vein being only 3 ft. thick, it was necessary to take down 3 to  $3\frac{1}{2}$  ft. of the roof to furnish sufficient height for haulage. The material thus secured was adequate for packing purposes. The work was done by contract, every four men having ten places. They contracted to make the crossgates 7 ft. high, to place packs 10 ft. apart on the haulage side, to put in a 4 to 6 ft. packwall with both face-, gate- and backwalls, to draw all timbers within the site of the packwall and make the crossgates and gateways in a safe and workable condition.

The gateways were 6 ft. high, 8 ft. between packs, and the same specifications also applied to crossgates. The contractors bought their own explosive, and the company furnished fuse, detonators and tools. The charge-man (fireboss) fired the shots. This work was done at 6/8, or \$1.62, per lineal yard. I was the master-shifter

(shiftboss) on the job and had full control of 150 men and six firebosses. When turning off a crossgate or gateway I always had a wood chock built at each corner, so as to help to stop the roof from breaking over the packwalls, and I found that this provision was quite helpful in protecting the crossgate.

The coal face was kept straight for lengths of about 250 yd. and was continually advanced by two Gillott & Copley coal cutters which were worked by compressed air. The frame on each machine was about 6 ft. long and 2 ft. wide and carried two cylinders 9 in. in diameter with about the same length of stroke. The cutter wheel was 4 to 5 ft. in diameter and carried on its circumference about 25 steel teeth. It cut to a depth of  $4\frac{1}{2}$  ft. with a

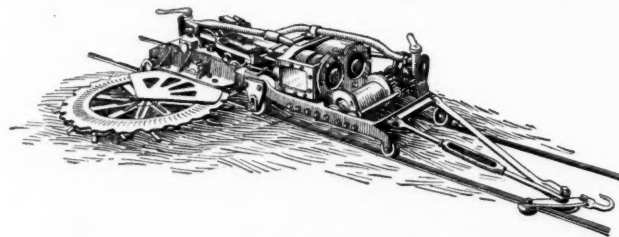


FIG. 2. AIR-DRIVEN DISK COAL CUTTER

3-in. kerf. These machines worked at a slow speed, the cutter wheel making 6 or 8 r.p.m.

The equipment ran along the face on rails and was fitted with a wire rope and drum which automatically drew the machine along the face. Two men working eight hours were employed to run a machine, which was kept continuously in operation by the employment of three shifts. The men were paid the standard wages of the district. On Sundays, or any other spare time which they had, the pipe lines were advanced, 6-in. pipes being laid up the main heading, 4-in. pipes in the crossgates and 2-in. pipes up every fourth gateway.

When one machine was halfway across this face the other was at the other end making ready to follow it. Each end of the face had to be advanced 6 or 8 ft., so as to allow the machines to start and finish. These places were driven by pickmen. The loaders each had three

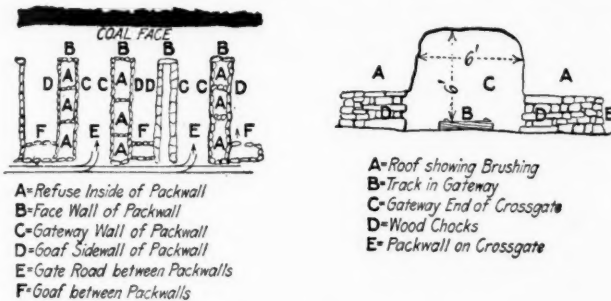


FIG. 3. PLAN OF LONGWALL FACE

places in which to load their mine cars and generally worked in pairs; they were paid 25c. per ton.

The coal was hauled by small ponies, the cars in use weighing only 1600 lb. when loaded. The drivers were paid by the score of cars hauled, and they received extra pay in all cases where the coal was hauled more than 100 yd. The coal cars were brought by the mules to the

\*709 North St., Clinton, Ind.



parting of the self-acting incline. Here trips of 10 cars were sent to the main haulage road and from thence they were drawn to the surface by an endless rope.

The ventilation system was simple. The air passed along the main road up the main headings and splits across the face and down the returns. It traveled over the main road by overcasts, and through the regulators to the upcast shaft. An open Waddle fan, 30 ft. in diameter, was used. It acted as an exhaust and drew 150,000 cu.ft. of air through the mine per minute, a

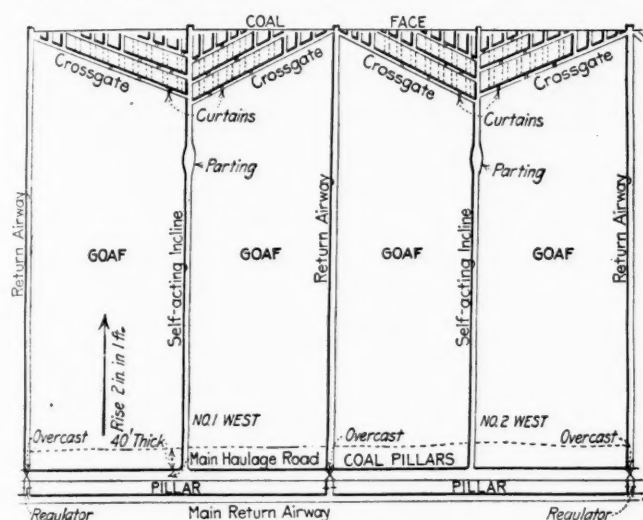


FIG. 4. PLAN SHOWING TWO LONGWALL DISTRICTS

continuous current being maintained along the face. This is more desirable than allowing the air to travel to and fro and through the small and numerous roadways provided in other methods of working. Furthermore, less doors and stoppings are required in ventilating longwall.

#### ADVANTAGES OF THE SYSTEM

The advantages to be derived from working any seam by this system may be briefly stated as below:

- The coal is generally extracted with only 5 or 10 per cent. loss.
- As the pickwork is confined to a few places or main roads, there is much less hand mining to do. Hence the coal is better and the cost of extraction lower than in mines operated by other methods.
- The coal is easier to work, and for this further reason the cost of extraction is reduced.
- The weight on the coal in longwall often reduces the labor of getting the coal, for if proper advantage is taken of it it will help to bring down the coal after it has been cut. This saves expense in blasting and results in the getting of a larger percentage of lump coal.
- Ventilation is more easily performed; the cost of gatticing is small and the haulage for a given output is reduced.
- More men can be employed on a given area, thus insuring a larger output. Fewer roads have to be kept open, and the cost of repairing such roads is consequently lower. As a result rails, ties and timbers are not required in such abundance.

The disadvantages of working longwall are few:

- The roads are more difficult to keep open, especially if the roof is wet and the floor soft. In the latter case a "creep" or "crush" occurs.
- Unless the work of extraction proceeds with regularity the ventilation of the mine workings is hindered.

c. Disturbances in the coal seam such as dikes, dislocations, horsebacks and faults are difficult to handle.

d. Longwall cannot be used in seams where enough suitable material is not obtainable for the building of packwalls.

Only competent and practical men ought to be employed as bosses in working longwall if it is to be worked successfully. At North Walbottle, the examiners went down two hours before the first shift of miners and examined their districts, generally about 30 places. They met the miners at the lamp-lighting station and told them the condition of their respective places, while examining their safety lamps. These examiners attended to the switch laying, which they could easily do as the gage of the road was only 30 in. and the rails 4 ft. in length. They also saw to it that the men had at hand plenty of timbers and other materials to insure their safety. Furthermore, they provided for the placing of the daymen and boys so that the coal output would be promptly taken care of. This mine hoisted coal during 16 hr., and the other 8 hr. was consumed by the night shift, which prepared the whole mine for hoisting next day.

## The Ballad of the Torn Boots\*

By CHARLES NICHOLLS WEBB

"Look at them boots," said Cap'n Dan,  
"Look at the way they're tore!  
They was wore by as careful a man  
As ever shoveled ore.

"Careful 'e was, but a single break  
'E made on a busy day,  
The foolishhest kind of a fool mistake  
That a man can make, I say."

"'Urried and rushed to reach the top;  
Ladder route, then, was too slow,  
Runs to the skip and gives an 'op,  
Just as she starts for to go.



THE LESSON OF THE TORN BOOTS

"Caught 'e was 'twixt plate and skip,  
Caught by the feet, you see—  
Something gives with a mighty rip;  
Out 'e pulls scot-free.

"Lucky 'e's got any bloody feet;  
That they wasn't took clean away.  
'Don't ride the skip' is a rule that's neat;  
Orders is made to obey.

"Look at 'is boots," said Cap'n Dan,  
'Learned 'im a thing, you bet!  
Never 'as been so careful a man  
As couldn't be carefuller yet."

\*From the "Engineering and Mining Journal."



# The Labor Situation

## General Labor Review

The agitation for a contract to meet the increased cost of living has spread to the anthracite region. This district has been affected by such agitation more slowly than others, because the mine workers have known that the large majority of the coal companies have held steadily to a price honestly based on the contract which went into effect Apr. 1 of last year.

Despite the fact that anthracite coal was woefully scarce and that the smaller operators were getting fabulous prices at the mines, the so-called "trust operators" kept the even tenor of their way and did not even endeavor by an increase in price to meet the high cost of operating due to the increased cost of powder and other supplies. They could not meet these charges by increasing the volume of business, for their men were leaving them and strikes were frequent. So the prosperity of the nation has had a somewhat unfortunate effect on the larger anthracite operators. It has restricted their operations and decreased their earnings.

### Miners Suffer Even More from High Costs

The same misfortune has involved the mine worker, in somewhat greater measure, for he spends a larger part of his gross income on material than does the coal company. Labor is the principal purchase of the operator, and for the most part its cost has not been changed since Apr. 1.

Word comes from Nesquehoning that the mine workers are considering a call for another convention to demand an increase in the wage scale to offset the advance in the cost of living. The mine workers allege that the prices of necessities are being boosted by the cornering of supplies. They declare that the farmers are not only asking all they can get, but are deliberately holding back the products of their farms to compel the mine workers to pay larger prices. One farmer near Hudsonale, who thus tried to take advantage of the needs of the miners, lost in the recent frost 2000 bushels of potatoes that he was holding for \$4 a bushel. The mine workers are preparing to protect themselves against high prices by planting their patches with potatoes and other garden truck.

The labor shortage in the anthracite region has, in small measure, been relieved by the suspension of 2000 out of 2600 shrapnel makers at the Jeanesville Iron Works. These men have been laid off for lack of material. As they were mainly men who had been induced to leave the mines for munition work, they will probably return to underground work, at least temporarily.

### Only Contracts with Middlemen Are Barred

It appears that the umpire of the Anthracite Conciliation Board does not oppose machine contracts if they are made individually with miners who will produce their own coal, even though the amount which such men can earn under the contracts made cannot be guaranteed to them any more surely than it is when the contract is given to a man who secures other men to mine for him. The umpire overlooks the fact that in both cases the guarantee is not of the substance of the contract, but has to be thrust in as a modification of its outcome—a modification that is only of power in deference to the general contract. His ruling is illogical and wrong, but being made it will be effective. If taken into court and decided on its merits, however, it would not stand a moment's inspection, so unsubstantial is the reasoning on which it is based.

### Middleman Paid Miners More Than Company

As the arbiter has made this distinction, for which the text of the agreement and the understanding of the signatories furnish him no warrant, the Delaware & Hudson Co. has been trying to make contracts with mine workers to mine coal with machines by their individual effort. Working for the despised contractors they received 40c. per ton. The company offers 31.95c., and the miners think it too little.

It is clear that so long as the miner makes as much under his contract as he made when working without the machine, the company may place any figure it pleases on the tonnage rate. It looks as if the mine workers used poor judgment in ousting the middleman.

The mine workers would be willing to let the matter be brought before the board, but declare that they are opposed to such an adjudication because it might be a year before it would be settled. The mine that is interested in this contract is the Gravity Slope, Archbald, Penn., at which 1200 men work.

### Slate Pickers and Firemen Demand New Scale

There is an Archbald mine belonging to the Delaware, Lackawanna & Western R.R., Coal Department, at Scranton, Penn., about 10 miles from the town of Archbald. The slate pickers at the breaker of this mine, and at that of the Pyne colliery belonging to the same company and located at Taylor, Penn., struck on Feb. 21 for increased wages. As a result 1400 men and boys are idle.

The firemen at the collieries of the Lehigh & Wilkes-Barre Coal Co. in the Hazleton district have struck for an increase from \$1.85 to \$2.25 per day. The losses of men to munition factories and the modifications made, and likely to be made, to prevent unrest seem to suggest that it would be more profitable to give some concession to all men alike and seek compensation by an increase in the price of coal. As it is, the companies are liable to find the wage scale less rigid than the price circular, a condition which would spell further reduced earnings for them.

### Neil Awards Back Pay to "Trouble Maker"

Finding that John Sock, a company miner in the service of G. B. Markle Co., at Jeddo, in the Hazleton district, Luzerne County was the victim of "discriminatory discipline," because of his activities as a member of the grievance committee, Charles P. Neil, umpire of the Anthracite Conciliation Board, on Feb. 24, ordered him reinstated. He also required that Sock be paid his daily wages from the time of his dismissal on Mar. 18 last, until the date on which he secured work elsewhere after being refused employment at operations near those conducted by the Markle firm.

According to the company, Sock was let out because he left his work before quitting time, but Sock contended that he generally notified the foreman when he quit ahead of the regular hour and complained that he was not treated with the same consideration as was accorded others who gave a similar notification to the foreman. Testimony of the company foreman showed that it was the custom only to warn men for the first offense. A second offense was followed merely by suspension. Only after fault had been found a third time was a man discharged. Sock, however, was discharged outright.

He was called a "trouble maker," and it is alleged that he was "marked" before he lost his job because he insisted that a decision of the umpire was not being strictly complied with.

### Operators Are Abandoning "Standard Weight"

Gradually the operators in central Pennsylvania are conceding the standard weight. The Pennsylvania Coal and Coke Corporation has long abolished it. The Terminal Smokeless Coal Co. on Feb. 21 gave up the use of it at the three mines which it operates on the Portage branch, and the men returned to work. More than 2000 miners are still out on strike, as 12 firms with 22 mines are still holding out, declaring that the scale contract is being violated by the suspension. The union officials take the same position as the operators, urging that all strikes are unlawful so long as the present contract lasts. The "United Mine Workers' Journal" in its pages completely ignores the issue.

The operators of 13 mines having "standard weight" strikes announced on Feb. 19 that they would appeal to the executive committee of the United Mine Workers of America, District No. 2. The executive committee says it has no jurisdiction because the walkout is purely regarding local differences which do not affect the union scale; besides nonunion as well as union men are out. Their indifference is perhaps not surprising, seeing the nature of the complaint.

The excuses they advance, however, have little or no validity. The union has repeatedly declared that it speaks for all the men, union and nonunion, and must be regarded as the representative of all. The district officers have moreover an interest in seeing the contract fulfilled in all its details, local or district-wide. Hence they must be held responsible.

On the other hand, they exercise wonderful forbearance in not actively supporting those who object to the standard scale. Its sanctity cannot be regarded for one moment as on a level with the sanctity of the wage scale, the working day provisions and the car-pushing requirement which different bodies of men have tried unlawfully to modify by strikes. To attempt to increase wages, to work shorter hours or to demand that cars be delivered at the face are flat violations of the contract; but the standard-weight provision is one by which fair weight has been too often evaded, if not at the Portage mines, at least at many other coal operations. A strike for its abolition is therefore by no means without some show of right.

#### Central Pennsylvania Seeking a Convention

The mine workers of central Pennsylvania are said to be circulating a letter asking the union men to vote for a special convention of district No. 2, to settle the car-pushing question, to demand a further wage bonus or equivalent wage increase and to decide other issues. A letter protesting against any such convention is also being circulated. The mine workers of the district should not attempt to modify the car-pushing question till the winter of 1918, when a new agreement is to be made. A committee composed of James Feely, James Marks and William Welch is supporting the movement in favor of a special session. The strikes at Portage, Dunlo and Beaver Dale regarding the standard weight will not be considered at this convention.

On Feb. 6, District President Purcell addressed a letter to President B. M. Clark, of the Association of Bituminous Coal Operators of Central Pennsylvania, demanding a joint conference of the scale committees of the district for the purpose of discussing and arranging a modification of the wage scale on the ground that the mine workers were not satisfied with the 10 per cent. bonus recently granted by the operators of district No. 2. Under date of Feb. 9, President Clark, for the operators, declined to participate in a joint conference, on the ground that the demand was unfair and unreasonable because the mine workers were working under a contract executed and entered into by the operators in good faith and which does not expire till Mar. 31, 1918. He cited to the mine workers the position taken by their national officers, that obligations under the contract must be maintained.

#### Strikes Much Reduce Somerset County Output

The report of Fletcher W. Cunningham, the mine inspector of the 20th bituminous district, shows how strikes and car shortage together have reduced the tonnage in Somerset County. In 1916 the output of this district was only 4,585,076 tons, whereas it was 5,626,093 tons in 1915. Strike conditions are now somewhat quiet. Two additional organizers, however, have been introduced into the Berlin-Myersdale section.

An increase in wage amounting to about 5c. a ton on pick mining and from 20 to 35c. a ton on day wages has been announced at the mines along the Baltimore & Ohio Ry. in Somerset County. There will also be a reduction in the working day from 10 to 9 hr.

Some coal operators in the Pittsburgh region are actively competing with the recruiting officers at Wheeling, W. Va. An ex-marine is meeting transients at the station and inducing the men to agree to go to the mines, transportation being supplied those who assent to his offer. As a result recruiting for the marine service has suffered a sudden decline.

In Ohio the mine workers are preparing to enter into a fight for a higher wage scale. Both the operators and their employees complain of the short running time, barely 25 per cent. of full time. This has made operation less profitable than it might well have been and has also impoverished the mine workers.

#### Kanawha Mine Workers Resent Delay in Bonus

Strange to say, in the Kanawha district of West Virginia, there is still much unrest. The Cabin Creek and Coal River regions have long ago agreed to meet fully the increases of wage in central Pennsylvania, though the new schedule does not start into operation till two months later. The mine workers on Feb. 15 held a meeting at Eskdale and protested against the delay and objected to the amount promised.

They declare that the operators violated the terms of their contract in refusing to pay the mine workers the 5 per cent. advance for "deadwork" that was granted in the central competitive region. They also allege that the operators are violating Clause No. 4 of their agreement by giving contract jobs in their mines. D. C. Kennedy, the commissioner for the Cabin Creek coal operators, is now in Florida, but the demands of the miners have been communicated to him.

A meeting was held at Fairmont, Feb. 22, by the Central West Virginia Coal Operators' Association, and it was decided

to increase wages by substantially the same amount as in November of last year. This raise will figure about 10 per cent. The working day will be reduced from 10 to 9 hr.

The Georges Creek field always increases its wages in consonance with advances in the Fairmont field. An increase in the price paid for mining coal has raised the rate to 85c. a ton. Mine laborers have had their wage increased 30c. a day. The working day has also been reduced from 10 hr. to 9 hr. Much activity has recently been shown by the union in the Georges Creek field, under the leadership of William Diamond and Van Bitner.

#### Illinois Wants Wages Based on Living Costs

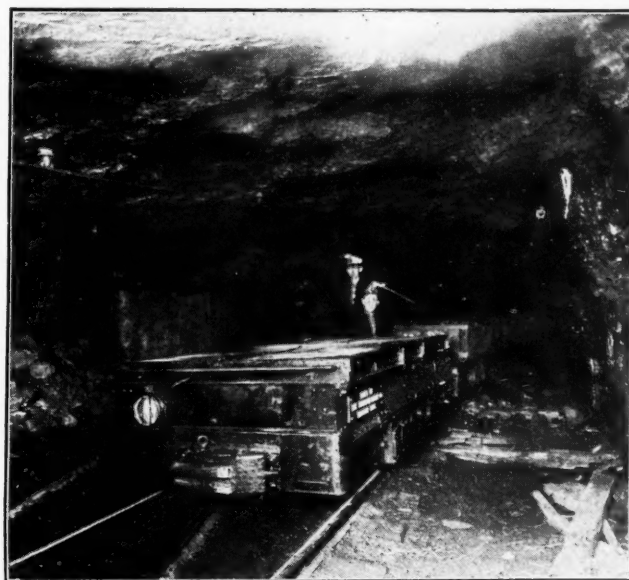
Advices from sources of authority in different sections of the southern Illinois mining field indicate that there is much unrest among the miners which may develop into something serious later on. At present the troubles are over minor matters, apparently, but behind these troubles is one real factor, and that is, that the miners are dissatisfied with the returns for their labor. As a result of the car shortage the miners have been making barely half time. The cost of many supplies has increased, and the cost of living has similarly risen, while the miners' incomes have decreased rather than advanced. On the other hand, they realize that while the operator is paying double for his supplies, he is getting double what he formerly did for his product; and as a result there is much unrest.

In the Southwest a new union movement has been started called the Working Class Union. It is apparently somewhat after the order of the International Workers of the World, though it is said to be even less definite in its objects. It has gained some ascendancy among the miners in Oklahoma, and one mine, No. 8 of the Central Coal and Coke Co., at Calhoun, is shut down as a result of a strike called by this new order.

#### Howat Is an Advocate of Dangerous Methods

Three recent mine explosions have shown quite plainly how much less deadly mines are which are equipped with mechanical shotfirers. Two men were killed at No. 15 mine of the Western Fuel Co. and two at No. 6 in the Huntington field, all four men by explosions while shotfiring by the usual methods. At No. 49 mine of the Central Coal and Coke Co., in Kansas, an explosion took place when shots were fired by mechanical means. Nobody, of course, was killed, and the men suffered nothing more than a few days' idleness.

It is reported that mine workers in one local who had been ordered to strike by President Howat, because mechanical shotfirers were in use, took two separate votes to determine whether they would obey the order of the president. On both occasions the mine workers determined that they would remain at work even though the mechanical shotfirers were not removed.



LOCOMOTIVE ON ENTRY SIDING WITH A TRAIN OF CARS

This motor serves 20 working places. It was built by the Ironton Engine Co., and is a new type of storage-battery locomotive fast coming into popular use.



## Power Department

### The Alternating-Current Mining Machine

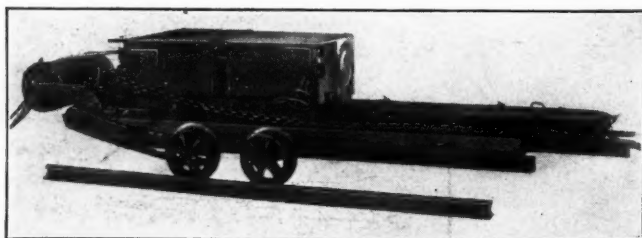
By C. E. BUTT\*

*SYNOPSIS—The undercutter driven by an alternating-current motor under certain conditions has many advantages over machines of the direct-current type. These advantages are greatest in the small mine or in one where direct current is not economically available.*

The early installations of electric power in coal mines utilized direct current for the stationary motors on the surface and also for pumping and other underground work. Standard types of direct-current machines were used. In the average mine the amount of power consumed by this class of motor was small in proportion to that consumed by the mining locomotives and coal-cutting machines. Special direct-current motors were designed to work within the confined spaces available on the coal cutters.

The use of the electric locomotive increased the area of the coal that could be economically taken from a given opening. This resulted in larger haulageways and in greater distances over which the power had to be transmitted from the station on the outside of the mine to the working face where the machines operate. The usual voltage employed was 250, which could not be transmitted more than a mile without requiring expensive circuits; and even then the voltage drop under overload became excessive.

To meet this changed condition some of the larger mines installed alternating current and transmitted it at high voltage to substations located near the working faces. This required the use of rotary converters or motor-gen-



SULLIVAN A.C. SHORTWALL MACHINE

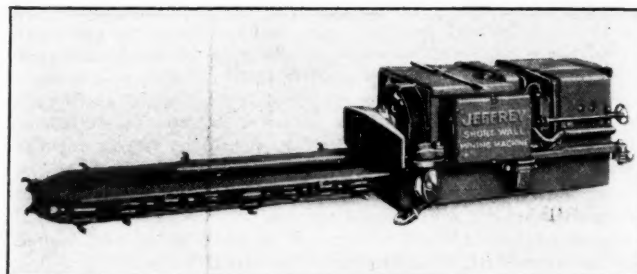
erator sets to convert the current from alternating to direct before it could be utilized by the cutting machines or the locomotives. This resulted in a large investment being required to transmit the power satisfactorily to the faces and change from the alternating to direct current.

The alternating current can be efficiently transformed from high to low voltage by the use of transformers that require little attention. Power can be carried to the work-

ing face on high-tension lines and reduced to any desired voltage.

To avoid the large expense of converting alternating to direct current the manufacturers of coal-cutting machines have developed the alternating-current motor-driven cutting machine. The use of this machine now enables current to be carried direct to the face and supplied to the cutting machine by the employment of inexpensive transformers, thus supplying any required voltage at any point in the mine regardless of what distance it may be from the main substation at the mouth of the mine.

Alternating-current electric power has been adopted as a standard by central-station companies. It is possible,



JEFFREY A.C. MINING MACHINE

therefore, to purchase this power from them, thus saving the expense of installing an isolated plant to generate current at the mine.

By the purchase of electric power from a central station the cost of installing a coal-cutting machine is reduced to a minimum, as the total required investment is that for the high-tension wire from the central substation to the inside transformers, the transformers themselves, and the wire for the transmission of power to the cutting machine. When purchased power can be used in conjunction with a coal-cutting machine, an instrument for higher production is placed within the reach of the small operator who is not able to bear the cost of his own generating station.

The general practice in installing an alternating-current cutting machine has been to use three single-phase transformers for stepping the potential down to working voltage. In the event of an accident to one of these transformers the remaining two can carry the full load and supply the power required.

A careful investigation has proved that the coal mines that derive the greatest benefits from this type of machine may be divided into four general divisions, classified as follows:

1. A small mine where the main haulageway is short, and with a grade in favor of the loads. In this type of mine the electrification of the haulage system would be quite expensive and would not show a commensurate return for the money invested, while the installation of a motor-generator set or rotary converter to furnish direct current for mining machines only would reach a prohibitive figure. The low cost of installation for an alter-

\*Alabama Power Co., Birmingham, Ala.



nating-current mining machine over the direct-current is obvious in this class of mines.

2. The installation of electrical equipment in a mine that has just been opened is more or less guesswork, as various future conditions may alter the power requirements to a marked degree. With an alternating-current mining machine driven by central-station power the mine, while in a state of development, gets the benefit of an economical cutting machine without any great expenditure for power equipment. If at any time the mine should require the change to direct current for haulage purposes, the motors of the alternating-current machine could be changed to direct current at a small outlay.

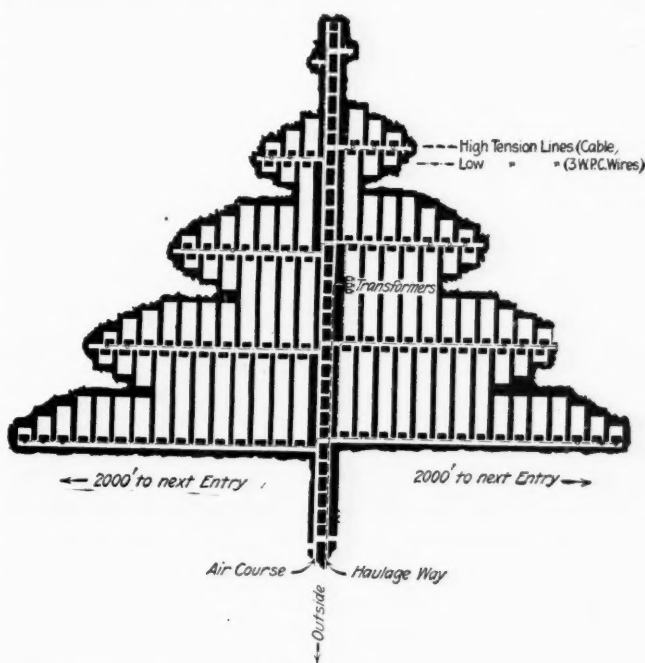
3. In a slope mine where the main haulage is performed by a hoisting engine, and the only use for power would be for pumping, ventilation and undercutting, the alternating-current mining machine is by far the most economical installation. It is in mines of this class that the alternating-current mining machine proves its real worth.

4. In a rolling mine where an endless rope or tail-rope system of haulage driven from some outside power source is employed, this type of machine offers the same advantages as in the third class.

In a mine where alternating-current machines are to be utilized, large tonnage should be developed in as small an

area as possible in order to secure the most economical use of the machines. This is shown in the accompanying diagram of a typical room-and-pillar working.

In this mine the rooms that are available for the mining machines are possibly far in excess of what the mining



TYPICAL ROOM AND PILLAR DEVELOPMENT USING A.C. MACHINE

machine is capable of cutting. In territory distributed as in this example one mining machine should cut at least 7 rooms in a working shift or 14 rooms on a double shift. This would give approximately 300 lin.ft. of coal per shift, depending, of course, upon circumstances, the above example being under average working conditions.

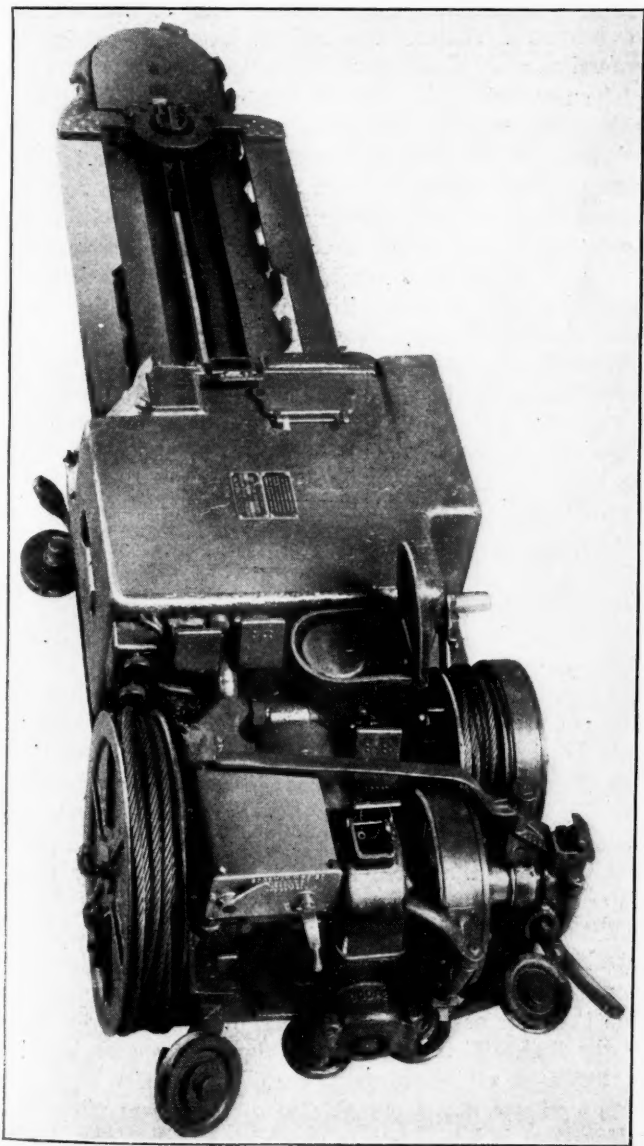
The power cost of operating a single alternating-current mining machine is comparatively low, as with the arrangement laid out in the diagram one mining machine would not use over 2000 to 3000 kw.-hr. per month working single shift. This small consumption of power is principally due to the mining machine having sufficient voltage at all times, and, therefore, working at its highest efficiency.

One mining machine in 4-ft. coal and with a  $7\frac{1}{2}$ -ft. cutter-bar should cut 300 tons to the shift, or 6000 tons a month, with a power expenditure of less than  $\frac{1}{2}$  kw.-hr. to the ton. This would be less than 1c. per ton on the average rate of central-station contracts.

A comparison of maintenance between the alternating- and direct-current machines shows favorably for the former. With direct-current power in use, especially with a mine that is supplied from some isolated power house on the outside of the mine and a considerable distance from the workings, the voltage is usually low; consequently, much armature trouble is experienced in the motor on the cutting machine.

With an alternating-current mining machine served from central-station power there is an assurance of good voltage, as at no place need the machine be at a greater distance than 1500 ft. from the distributing transformers. This distance in any mine will give the mining machine more territory than it is possible for it to work.

The direct-current mining machines have the inherited qualities of the direct-current motors—that is, large



GOODMAN A.C. MINING MACHINE

starting torque. If these machines are operated when the voltage is too low, the result is frequent burnouts.

When the voltage on an alternating-current machine is too low the machine will not start at all, and the line, therefore, will of necessity be kept in a better condition.

With the direct-current machine much annoyance is caused by brush trouble. This is not possible with the alternating-current machine, since its motor has no commutator and therefore no brushes.

Partly due to the fact that the manufacturers of electrical apparatus have not as yet been able to develop an alternating-current mining locomotive equal to a direct-current locomotive, and that almost every operator is more or less familiar with direct-current power, there is a certain amount of skepticism in regard to the use of the alternating-current machine.

It is quite reasonable that the alternating-current machine has its field, and this field at the present time is in the four classes mentioned earlier in this article.

It has been shown in general practice that alternating-current power is the best for all ordinary mining purposes other than electric haulage. In those fields where central-station power is sold to the coal mines, pumps, hoists, fans and tippie equipment are all run by alternating-current power and with more satisfaction than has ever been experienced with direct current.

In the mine where alternating current is available and electric haulage is required it would be an added expense to install wire for alternating-current cutting machines, as the conductors that supply power for haulage can be used for direct-current cutting machines. This accounts for the general use of direct-current coal-cutting machines in the large mines where electric haulage is employed.

To the small operator with limited capital the alternating-current mining machine has shown the way to a greatly increased production without the large investment that has been required heretofore. He is enabled to decrease mining costs and increase his tonnage for comparatively little money invested above the initial cost of the machine itself. When the number of small operators is considered the tonnage increase through the use of central-station power and the alternating-current mining machine will reach amazing figures.

## Coal Output of Eleventh Pennsylvania Bituminous District

BY J. J. McDONALD\*

In 1916 9,428,361 tons of coal were produced in the eleventh bituminous district of Pennsylvania which includes parts of Westmoreland and Fayette Counties. This is an increase in output of 1,275,107 tons over that of 1915. The coal production by pick was 6,556,973 tons, by compressed-air machines 735,562 tons and by electric mining machines 2,135,826 tons. The number of men employed were 2827 outside and 5256 inside. Twenty companies operated 43 mines in the district; all of these mines were in operation during the year.

The production by counties were: Westmoreland, 7,750,678 tons; Fayette, 1,677,663 tons.

There were 17 fatal accidents inside of mines and two outside of mines and 57 nonfatal accidents inside of mines and 12 outside.

\*Mine Inspector for Eleventh Bituminous District, Greensburg, Penn.

## Recollections of a Manager

Some years ago, I was asked to read a paper before a national engineering society and, much as I regretted it, felt compelled to decline the honor because I felt that I could not spare the time that would be required to prepare the paper. I attended the meeting, however, at which the paper was to have been presented and while en route happened to travel with the man who read the most valuable paper delivered at the meeting. I had not made his acquaintance on the journey and so did not know who he was, but I did observe that he had no time for conversation on the train, since he wrote continually. After I was introduced to him at the meeting, I made bold to ask him how much time he had given to the preparation of his paper and was surprised to learn that he had prepared it entirely while going to the meeting from his home. In other words, he had written it during the hours that I had found time so heavy on my hands, alternating chats in the smoker with snatches of reading in a magazine purchased from the train newsboy.

I made a resolve then and there to write a certain number of pages of manuscript for every one hundred miles of railroad travel that I should be compelled to make in the future, and in looking back over the days that have passed since then I realize that to that resolve I owe most of whatever reputation I have acquired in my profession.

The man who gave me the inspiration wrote entirely with a lead pencil, but I decided that a portable typewriter would have many advantages when it came to producing manuscript on a jerky train, and I soon became quite an expert with a writing machine. In deciding to try out a machine for writing, it never occurred to me that I might turn out more work, but after a little practice I found that I could write with nearly twice the speed when using the machine.

When I made the resolve to write a certain number of pages whenever the opportunity should present itself I had no very definite ideas as to the subjects that I should cover, and yet, strange as it may seem, I have never had the least bit of trouble in deciding upon a subject once I found time available.

Another surprising thing about this writing business, as my wife calls it, is the effect that it has had on my ideals and my outlook upon life. Time was when I suffered much from spells of dejection, and when those spells came upon me I lost all interest in my surroundings; with the advent of this new avocation, taking so much of my spare time, the periods of depressed mental state have disappeared, and I have reached a condition now where it is difficult to realize how I could have become so influenced by my feelings. I have even traveled a little in the opposite direction and take spells of philosophizing to the extent of pointing out to my associates the folly of giving way to one's feelings.

Without being conscious of it, I have in a way divided myself into two distinct personalities—the one acting manager of a corporation, the other who stands just outside the door at all times passing judgment on the acts of the first. That seems like a figure of speech, and it is, but as a matter of fact when I look back over the events of any day I am able to discuss them with myself just as if I had been a spectator and not one of the actors.



## Coal-Mining Efficiency in South Africa

By ROWLAND B. GASCOYNE\*

Some attention has quite recently been attracted to the high efficiency existing as regards the average production per person employed at many of the collieries in the United States as compared with those in Great Britain and the Colonies. One writer attributed the higher production per head per day to the employment of large mine cars, but the explanation is more likely to be found in the thickness of the seam worked and the greater ease with which the coal can be broken from the face. Conditions underground vary so much in different countries that it is difficult to make useful comparisons, and it is only by taking a group of collieries in the same neighborhood, and working under as near as possible the same conditions, that useful deductions can be made.

In the annual report of the Inspector of Mines for the Middelburg District of the Transvaal for last year, which has only just been issued, appears an interesting table, showing the results obtained at several of the principal collieries in that district. This statement has the advantage of applying to collieries working the same seam over an area where the underground conditions are similar. Still the results vary somewhat, and it may prove of interest to attempt to explain the cause of the variations. The system of working is similar throughout, with one exception, the method adopted being the pillar and stall. The stalls or bords are 20 ft. wide and driven from 60-ft. centers. The seam of coal runs practically level, and has a gross thickness of about 20 ft., but only the lowest portion is worked, the greatest proportion of the seam being too inferior to find a sale. The portion worked varies from 3 to 11 ft. The table mentioned is as follows:

Colliery	Total Men Employed	Coal Mined per Head per Month, Tons	Thickness Worked, Ft.
Transvaal and Delagoa Bay.....	788	66.6	11
Tweefontein.....	774	59.7	6
Cassell colliery.....	482	56.0	6
Coronation.....	528	54.9	9
Witbank colliery.....	1,374	52.0	5½
Middelburg colliery.....	438	47.3	9
Oogies colliery.....	1,199	39.3	3½

The most striking influence on the production per head shown on this table would appear to be that of thickness, the Transvaal and Delagoa Bay collieries being easily first with an average of 66.6 tons of coal mined per head per month. At this colliery no coal cutters are used, which makes the influence of thickness all the more striking. If we turn to the Oogies colliery, at the bottom of the table, we find that the thickness of the seam extracted is only 3½ ft., and the average amount of coal mined per month only 39.3 tons. To obtain this result at Oogies 70 coal cutters are employed, as against none at the Transvaal and Delagoa Bay collieries. The results at Oogies would further seem to show that in the Transvaal, with coal selling at \$1 per ton, a 3-ft. seam of coal is as thin as can be worked by pillar and stall at a profit.

In the Transvaal the use of coal cutters generally increases the output by 50 per cent. Last year 70 per cent. of the coal mined was produced by coal cutters. A native, however, can rarely cut a length of 50 ft. six feet under in a day of nine hours.

The table of results obtained in the Middelburg District of the Transvaal shows that the thickness of the

seam worked is the most important factor governing results. Hardness of coal and character of roof come next, inclination of seam follows, and under normal mining conditions the size of the mine car comes last; always provided, of course, that a size of mine car has been selected, well suited to conditions underground.

It must not be understood, however, that the efficiency throughout the Transvaal is in all cases equal to that of the Middelburg District, the average for the whole of the Transvaal being 48 tons per head per month. In Natal where the seam worked averages only 4 ft. thick, and the coal is somewhat difficult to work on account of bad roof, spontaneous combustion and firedamp, the average is only 28 tons per head per month. In the Orange Free State, with a seam 7 ft. thick, but unusually hard in structure, the average mined per month per head is 35 tons. In the Cape Province where the collieries are small and the seams are thin, and carry more waste than coal, the average last year was as low as 7 tons per head; but here the collieries are often idle most of the time.

## Bureau of Mines Wants an Engineer

The United States Civil Service Commission announces an open competitive examination for mining engineer, chief of coal-mining investigations, for men only. A vacancy in the Bureau of Mines, Department of the Interior, for service in the field with headquarters at Pittsburgh, Penn., at a salary of \$4000 a year, and future vacancies requiring similar qualifications will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The duties of this position will be to take charge of coal-mining investigations in the mining division, to supervise investigations into the causes and prevention of explosions and other accidents in coal mines, investigations into coal-mining methods with the view to increasing economy and efficiency, lessening the loss of coal in mining operations, and otherwise contributing to the advancement of the coal-mining industry.

Competitors will not be required to report for examination at any place, but will be rated on the following subjects, which will have the relative weights indicated, on a scale of 100: (1) Education, 30; (2) professional experience, 50; (3) publications, reports, or thesis, 20.

Graduation from a course in mining engineering at a college or university of recognized standing and an experience of 10 yr. in mining engineering, of which at least 5 yr. must have been responsible experience in coal mining, are prerequisites for consideration for this position.

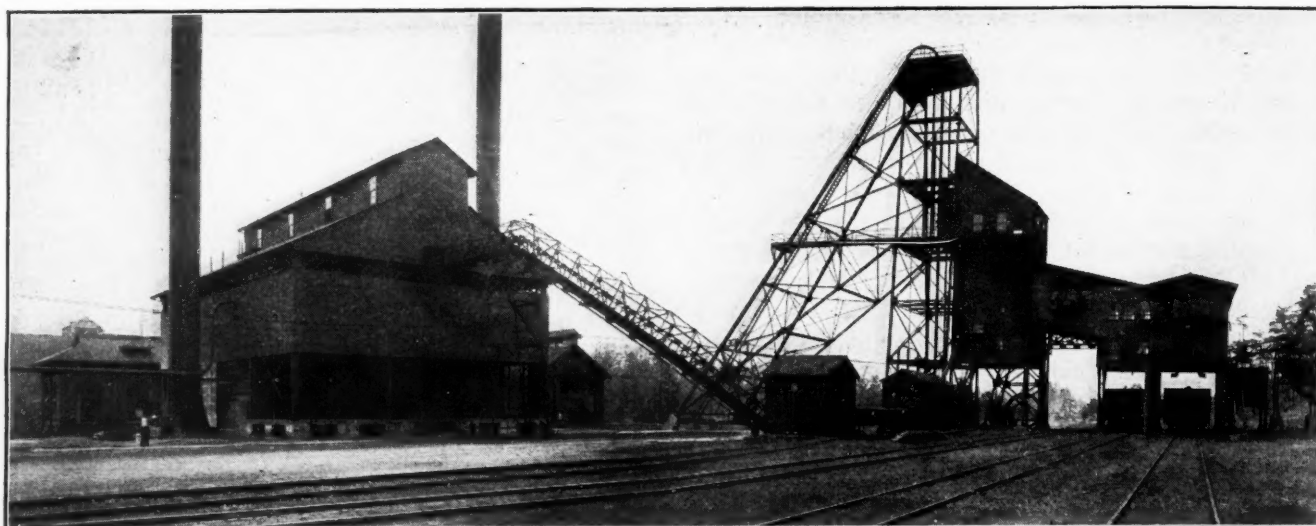
Statements as to education and experience are accepted subject to verification. Under the third subject the applicant must submit publications, reports, or a thesis. If a thesis is submitted it should deal with some phase of coal mining. Applicants must not have reached their forty-fifth birthday on the date of the examination. This examination is open to all male citizens of the United States who meet the requirements.

Applicants should at once apply for Form 2118, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C., or to the secretary of the United States Civil Service Board in any of the large cities.

\*Johannesburg, Transvaal, South Africa.



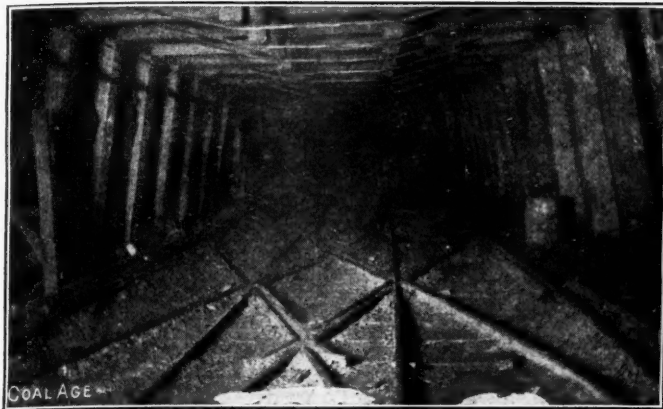
## Snapshots in Coal Mining



EDGEWATER MINE OF THE TENNESSEE COAL, IRON AND RAILROAD CO., NEAR BIRMINGHAM, ALA.



SHOWER BATHS IN WASHHOUSE AT DIAMOND MINE OF THE DELAWARE, LACKAWANNA & WESTERN COAL CO., SCRANTON, PENN.



TIMBERING AT SHAFT BOTTOM IN A KANSAS MINE



NO. 4 MINE, CANADIAN COLLIERIES CO., VANCOUVER, B. C.



BOWER, W. VA., MINING TOWN OF DAVIS COLLIERY CO.



NO. 3 TIPPLE, DAVIS COLLIERY CO., HARDING, W. VA.



MAPLE HILL COLLIERY OF THE PHILADELPHIA & READING COAL AND IRON CO., ST. NICHOLAS, PENN.



## RECENT LEGAL DECISIONS

**Lessor's Liability to Lessee's Employees**—An employee of a mine lessee is not entitled to recover against the lessor for injury sustained through a defective condition of the premises, unless the defect was latent, not discoverable by the lessee and his employees in the exercise of ordinary care, was known to the lessor, and not disclosed by him. (Kentucky Court of Appeals, *Bryant vs. Imperial Jellico Coal Co.*, 182 Southwestern Reporter, 205.)

**West Virginia Compensation Act Applied**—Where a coal company's offices, the entrance to its mine, and the larger part of the mine were situated within West Virginia, the Workmen's Compensation Act of that state applies to an accident to an employee residing in West Virginia and regularly employed in the part of the mine lying within the state, although the accident occurred while he was temporarily working across the line. (West Virginia Supreme Court of Appeals, *Gooding vs. Ott*, 87 Southeastern Reporter, 862.)

**Liability for Certified Mine Foremen's Negligence**—Under the laws of West Virginia, where a mine foreman, in addition to his statutory duties, is also the representative of the operator in employing and discharging miners and in assigning them to their places of work in the mine, the operator is liable for injury to a miner assigned by the foreman negligently and without warning to a dangerous place; the injured man being ignorant of the danger and free from fault. (West Virginia Supreme Court of Appeals, *Haptonstall vs. Boomer Coal and Coke Co.*, 89 Southeastern Reporter, 723.)

**Phases of Coal-Sales Contracts**—Under a contract to supply a manufacturer with all coal of certain size which he requires in the operation of his plant for a stated period, on the seller defaulting in delivery and the buyer taking for immediate need fuel from a supply obtained elsewhere, the buyer is entitled to replace such fuel with coal afterward delivered under the contract, and in doing so and ordering to cover further needs he cannot be deemed to have ordered in excess of his requirements. But when a claim for damages is asserted by a buyer for failure to make contracted deliveries, the seller is entitled to show that the buyer presented a written demand for damages aggregating less than the amount claimed in suit, unless it appears that such demand was in the nature of an offer to compromise the claim in avoidance of litigation. (Wasson Coal Co. vs. American Refractories Co., 193 Illinois Appellate Court Reports, 374.)

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## Breach of Coal Sale Contracts

By A. L. H. STREET\*

A subscriber to *Coal Age* asks information as to the legal rights and liabilities arising between two coal companies on refusal of one of them to make further shipments under a contract for sale of coal after having made partial deliveries, where market values have advanced in the meantime, with a particular view of the buyers' right to withhold money due for fuel delivered before the breach.

Assuming that the buyer was not in such default in the performance of its obligations as to entitle the selling company to treat the contract as rescinded, it is clear that the buying company is, at least, entitled to retain enough of the money due for coal actually delivered to cover damages sustained through the seller's breach as to the undelivered installments. The information before us shows no right in the buyer to retain more of the money than is necessary to cover such damages. If the contract was in the ordinary form of an agreement for delivery in installments and for payment upon or after each delivery, any excess of the unpaid price for coal delivered above the buyer's damages is collectible by the selling company. If the damages exceed the amount of such unpaid purchase price, the buyer has a valid claim for the excess of the damages, enforceable by counterclaim in the seller's suit.

\*Attorney at law, 829 Security Building, Minneapolis, Minn.

It has been generally held by the courts that a contract for a sale of coal to be delivered and paid for in installments is so far separable as to installments delivered and those undelivered that the seller may recover the price of those delivered, subject to liability in damages as above stated. (*Tuttle-Chapman Coal Co. vs. Coaldale Fuel Co.*, 136 Iowa Reports, 382; 113 Northwestern Reporter, 827. *Indian Mountain Jellico Coal Co. vs. Asheville Ice Co.*, 134 North Carolina Reports, 574; 47 Southeastern Reporter, 116. *Scott vs. Kittaning Coal Co.*, 89 Pennsylvania State Reports, 231. *Coal Co. vs. Colliery Co.*, 211 Federal Reporter, 313.)

In applying the rule last stated, it will be presumed that installments were to be paid for as delivered, in the absence of agreement to the contrary. That is, a contract of sale will not lose character as an agreement severable as to installments delivered merely because there was no agreement as to when they should be paid for. (*Tipton vs. Feitner*, 20 New York Reports, 423.)

But if the language of the contract or surrounding circumstances show that it was the mutual intention of the parties that delivery of the full contract quantity should be a condition precedent to the seller's right to recover anything on the agreed price, the buyer is entitled to withhold all payment until full delivery. (*Producers Coke Co. vs. Hillman*, 90 Atlantic Reporter, 144, decided by the Pennsylvania Supreme Court and cited at page 66 of "Legal Decisions Affecting Coal and Coke," published by *Coal Age*. *Providence Coal Co. vs. Cox*, 19 Rhode Island Reports, 380, 35 Atlantic Reporter, 210.)

### MEASURE OF DAMAGES RECOVERABLE

The measure of damages ordinarily recoverable by the buyer in a case of this kind is the excess of the market value of the coal at the time and place when and where the seller agreed to deliver above the contract price. If there was no market value at that time and place, the damages are to be ascertained with reference to the then market value of the coal at the nearest market, plus cost of transportation to the particular place. (*Missouri Coal Co. vs. Pomeroy*, 80 Illinois Appellate Court Reports, 144. *Tuttle-Chapman Coal Co. vs. Coaldale Fuel Co.*, above cited. *Tradewater Coal Co. vs. Lee* 68 Southwestern Reporter, 400, decided by the Kentucky Court of Appeals.)

## COMING MEETINGS

**The New England Coal Dealers' Association** will hold its annual meeting Mar. 28 and 29, at Boston, Mass.

**Canadian Mining Institute** will hold its annual meeting at Montreal, Can., Mar. 7-9. Secretary, H. Mortimer Lamb, Ritz-Carlton Hotel, Montreal, Can.

**American Society of Mechanical Engineers** will hold its spring meeting May 21-24 at Cincinnati, Ohio. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

**American Chemical Society** will hold its spring meeting week of Apr. 9 at Kansas City, Mo. Secretary, Charles L. Parsons, Washington, D. C.

**Mine Inspectors' Institute of the United States of America** will hold its tenth annual meeting July 10 at Indianapolis, Ind. Secretary, James W. Paul, Empire Building, Pittsburgh, Penn.

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Every Reader of "Coal Age" is invited to contribute an article to the Success Number, which will appear Apr. 7. Pick out the most successful man, method or machine you are acquainted with and give us the story. Get the article to us by Mar. 20 at the latest.



## Editorials

### Hill and McGraw Papers Combine

The Hill Publishing Co. and the McGraw Publishing Co., Inc., have consolidated as the McGraw-Hill Publishing Co., Inc. The new company acquires all the properties and interests of the two constituents, including the following engineering journals: *Electrical World*, *Electrical Merchandising*, *Electric Railway Journal*, *Engineering Record*, *The Contractor*, *Metallurgical and Chemical Engineering*, *American Machinist*, *Power*, *Engineering News*, *Engineering and Mining Journal*, and *Coal Age*.

Two of these papers, the *Engineering News* and the *Engineering Record*, occupying practically the same field, will be consolidated as the *Engineering News-Record*, with Charles Whiting Baker as editor. E. J. Mehren, who has been editor of the *Engineering Record*, becomes vice-president and general manager of the new corporation.

Many advantages in the matter of service will result from the combination of these two great publishing houses. The combined experience and ability of the two organizations will enable the new and larger company to render a higher quality of service to the entire technical world. The high aims and ideals of both publishing houses will be preserved, and in fact strengthened.

The officers of the new company are: James H. McGraw, president, and Arthur J. Baldwin, vice-president and treasurer. The consolidation forms the largest engineering publishing house in the world. The 10 papers of the new company reach 175,000 members of the various industries served.

### The New Anthracite Prices

During the past week there has been considerable discussion as to the new spring prices. A majority of the dealers are earnestly hoping that there will not be the regular reduction of 50c. per ton, and they may even petition the operators to that effect.

The dealers are urgently claiming that a reduction in the present price of coal would mean a serious loss to them. After the experiences of this winter, they believe there will be no trouble in selling coal and anticipate all the business they can handle from April to September.

If the prices are reduced, they will be flooded with orders during April that will take all summer to deliver, and if the business is accepted in April, that month's price will have to be protected until deliveries can be made.

In this event each month's increase will add to the dealers' cost price an amount that cannot be collected from the customers, as the retailers cannot be as independent as the shipper and cancel all unfilled orders at the end of each month. There is some talk of dropping the price 25c. per ton on Apr. 1 and advancing it 5c. monthly until the maximum is reached on Sept. 1.

Pea coal will undoubtedly be advanced over the present circular of \$2.80, and if buckwheat contracts are taken at

\$2.50 the circular price, if any, will naturally be higher to the dealers though, no authentic information is at hand as yet, and it is doubtful if anything definite has been decided. However, we have reason to believe the matter is now under advisement, and with March here it cannot be delayed much longer.

### Censorship on Ocean Shipping Records

For the past several years, *Coal Age* has been publishing the most complete data available concerning ocean clearances, shippings, rates, charters, etc. At an appreciable increase in cost, this matter has been arranged in tabular form to make it more accessible and to facilitate reading. Beginning with this issue, this department will be restricted materially, for reasons that are too obvious to require explanation. It will be noticed, for instance, that the customary statement of shipments from Hampton Roads ports has been omitted, and it is probable that the succeeding issues of the paper will not contain similar information from other ports.

It should be understood that this information is not being discontinued as the result of any interference from Government sources. We are taking this action purely on our own initiative. In addition, it must not be inferred that the information is no longer available to us, as such is not the case. While our plans are rather indefinite at the moment, it is the intention at the present time to resume the publication of the Hampton Roads clearances as before, with the exception that the weekly list will appear 30 days late.

### Retailer Retains Nearly as Much as Producer

The consumer is continually protesting against the cost of anthracite as delivered in his cellar. For this reason it is necessary to call frequent attention to the large proportion of that cost which is involved in the placing of the coal after it has left the producer's hands. The cost of merely delivering the coal, even after it has been transported to the coal dock, is often as large as the cost of producing it. It is customary to say that this is wholly wrong and inexcusable, for in the mind of the public the retailer furnishes no considerable service. Yet it must be remembered that he has to haul the coal in most cases at least as far as does the producer, on a roadway not nearly so well suited to transportation.

He has to deliver it to the consumer in a place which seems purposely chosen for its inaccessibility and at a period of the year, for the most part, least favorable to such delivery. If, in unloading his coal, the retailer had just to take a hammer and lift a latch, and the coal would flow immediately into a hopper, the costs of retailing would be immensely reduced. But when the coal must be run into barrels and these barrels must be rolled the half depth of a lot and dumped one by one through a

cellar window, the labor cost of handling a ton of coal is greatly increased. If the work were done by men who labored at this the day long, as coolies do when loading a ship with bituminous coal or like men working on a mining tippie, conditions would not be so unfavorable. But the retailer's men have to travel as far as the coal is hauled and are mostly unemployed while making the trip. As a result the retailer and hence the consumer are paying for much waste of time which neither of them can avoid.

The only way in which the losses may be eliminated in large measure is by the consuming public eating and living together in a close community life. Then the coal-delivery problem will be in such large units that it can be handled with economy. For the present there is little probability of any such consummation and few there are who think it desirable even if it could be arranged.

In fact the prospect is that the future will be less favorable than the present, because the demand for greater comfort and more seclusion is making the cellars and houses more inaccessible than ever. The older types of buildings that one finds in serried rows in the more metropolitan areas can be supplied direct by chute from the wagon, while the buildings in the newer and less congested sections cannot be so easily reached.

It is true that by a parcelling out of the city among coal dealers some waste of effort could be prevented, but retailing will never cease to be costly. It is interesting to note the costs of mining, transporting and retailing in New York City and Philadelphia as contained in the report of the Pennsylvania Anthracite Coal Commission. The figures are based on the long ton and the percentages given are for the whole cost of the coal to the consumer at the point of delivery.

DISTRIBUTION OF COAL COSTS IN NEW YORK CITY

Coal Size	Consumer Pays		Retailer Retains		Transporter Retains		Producer Retains	
	Per	Amount	Per	Amount	Per	Amount	Per	Amount
Grate.....	\$7.28	\$4.60	\$2.68	36.81	\$1.60	21.98	\$3.00	41.21
Egg.....	7.28	4.85	2.43	33.38	1.60	21.98	3.25	44.64
Stove.....	7.28	4.85	2.43	33.38	1.60	21.98	3.25	44.64
Chestnut.....	7.56	5.10	2.46	32.54	1.60	21.16	3.50	46.30
Pea.....	5.88	3.55	2.33	39.63	1.45	24.66	2.10	35.71

DISTRIBUTION OF COSTS OF PHILADELPHIA LINE SHIPMENTS  
(From Schuylkill Region)

Coal Size	Consumer Pays		Retailer Retains		Transporter Retains		Producer Retains	
	Per	Amount	Per	Amount	Per	Amount	Per	Amount
Egg.....	\$6.25	\$4.95	\$1.30	20.80	\$1.70	27.20	\$3.25	52.00
Stove.....	6.50	5.20	1.30	20.00	1.70	26.15	3.50	53.85
Chestnut.....	6.75	5.35	1.40	20.74	1.70	25.19	3.65	54.07
Pea.....	5.25	3.90	1.35	25.71	1.60	26.66	2.50	47.63

There is one way in which the cost of retailing might be reduced. If orders could be placed early in the year by all the consumers in a given block, and if these orders were placed with one dealer who would then deliver to all the consumers in that block at about the same time, the waste of labor would be reduced to a minimum. But this is a counsel of perfection. The least regulable man on earth is the consumer. He takes on himself always to berate the industries. If he would only discipline himself, he might find the industries not so badly organized to serve him.

The American's home is his castle. He runs it as he pleases. When he goes to work at his mill, his office or his mine, he is not so arbitrary. He organizes that so as to produce results with some degree of efficiency. The home is the epitome of disorganization, and the retail trade which ministers to the home suffers from this fact.

No one hopes or even wishes to change that condition, but it is a little hard to blame the retail trade with its inefficient operation when the home arrangements are the real cause for that inefficiency. Living at wholesale we could supply wants at wholesale with economy, but living as we do we can never hope to arrive at efficiency in distribution.

We live in small units while we work in large groups. The home industry has died a natural death and we all assemble *en masse* for our work. Perhaps in time a change as significantly economical will come in our home life. Then the cost of production and railroad transportation will come nearer being the whole of the "delivered cost."

## New Coal-Tax Act Proposed

Apparently undaunted by the invalidation of the tax act of 1913 and the seeming inertness of the 1915 law, a new coal-tax measure has been introduced into the Pennsylvania Legislature now in session. This bill proposes to levy a 2½ per cent. tax on both anthracite and bituminous coal and is presumed to be so drawn that if one section is declared unconstitutional it will not affect the others. While it may seem feasible to tax anthracite because of the monopoly created by nature and the geographical lines of man, it is hardly possible that any one would seriously think of saddling such a handicap on bituminous coal, because of the close competition with neighboring states.

Apparently this proposal to include bituminous coal is being thrown out as a sort of sop to the anthracite interests in the hope of lessening their opposition. Certainly it will take a clever mind to create such a bill that one of its provisions could be rendered invalid without affecting the others and, as before stated, it is hardly conceivable that it is actually the intention to tax bituminous coal. The attention of hard-coal operators is drawn to the fact that it is not a new trait for dusky-hued Senegambians to haunt fuel piles.

## Shortage in Screen Sheets

It is becoming a matter of considerable difficulty to obtain the blank sheets and plates that are used around mine tipples. These sheets, after being perforated, are employed for the screening of coal, especially the buck-wheat sizes of anthracite, and the cost of these supplies, therefore, may be expected to rise in the near future.

It may be noticed that in the report of the Pennsylvania Anthracite Coal Commission not a single item of the many materials entering into mine work became cheaper between 1912 and 1916. A solitary article is listed as having increased in price only 2 per cent., the others showing increases ranging from 10 to 103 and 142 per cent.

On averaging the items, without endeavoring to give any of them their due relative weight, the cost of mine materials appears to have gone up 39 per cent. The rise in market prices is therefore proving a most serious burden on the anthracite industry, and the public must expect that it will be called on to foot the bill sooner or later, especially as the soaring of prices has been more rather than less marked during the period since the making of the report.



## Discussion by Readers

### Bruceton Test of Clearfield Dust

*Letter No. 2*—Speaking of the Bruceton test made by the Federal Bureau of Mines, to prove or disprove the explosibility of the coal dust taken from the mines of the Clearfield region, one writer, *Coal Age*, Dec. 23, p. 1057, contends that the test "can have no practical value," unless the bureau engineers "explain in what manner the conditions in the Bruceton mine differed from those existing in the mines of the Clearfield region."

This would naturally be taken to mean that the bureau engineers should explain what is already known to every mine official, mine owner and miner; namely, that practically all bituminous coal dust is explosive under certain conditions and quite as certainly nonexplosive under other conditions.

As I understand it, the Federal test was not made for that purpose, but solely to convince a few obtuse mine owners operating in the Clearfield district that the dust taken from their mines is explosive under possible conditions. In my opinion, the engineers of the bureau accomplished their purpose when they proved by this test that the Clearfield dust could be exploded under conditions that may be assumed to exist in coal mines. They have demonstrated the possibility of hazard arising from the presence of the dust in the mines of that particular field.

#### RELATION OF THE BUREAU OF MINES TO THE COAL INDUSTRY

In fulfilling their duty to the coal-mining industry of this country, and the Clearfield district in particular, the Bureau of Mines need not concern itself with the question of ascertaining under what conditions the dust of the Clearfield mines can be considered as inexplosive; or what mining conditions would increase or decrease the susceptibility of this dust to explosion. In attempting to do that, the bureau would properly be open to criticism, by suggesting possibilities that would tend to make mine officials and miners less cautious of the real hazard involved in permitting the accumulation of dust.

In my opinion, the Bureau of Mines is as willing and anxious, today, to offer its assistance and lend its aid in any research work relating to safety in mining; but, in respect to the possibilities or probabilities of the coal-dust hazard in any particular mine or district, its duty ends when it has proved beyond a doubt that such dust becomes explosive under conditions that may be assumed to arise in coal mining. Strange as it may seem, the explosibility of the Clearfield dust was a moot question among certain mining men in that district, who, it may be hoped, have been convinced by the results of the Bruceton test.

The opinion seems to have been growing among the operators of the Clearfield mine that, because the mines of that district have been practically free from coal-dust explosions, the presence of the dust in those mines was not a menace to safety. In their opinion, the Clearfield coal could be classed with lignite or anthracite, in

that respect. It will be generally conceded, by thoughtful men, that the Bruceton test has not failed of its object if it has shown the fallacy of this reasoning. The matter of reducing the hazard by wetting the dust is one that concerns only mine owners, officials and mine workers, together with the writers of insurance under the Compensation Act.

The suggestion made in the letter to which I have referred (page 1057), that insurance companies doing business in Clearfield County "would use the results of the test as a strong argument to boost their rates," is an unfair assumption and unjust both to the bureau engineers and the insurance companies. As I have explained, the object of the test was fully accomplished when the explosibility of the dust was shown.

In regard to the insurance companies "boosting rates," I am in a position to state that there is no disposition on their part to take advantage of the proving of a fact that was already quite well known and established. Indeed, the effect of the Bruceton test, as far as the insurance companies are concerned, is favorable to their ends, since it tends to reduce the hazard that existed previously in these mines. Eventually, the Bruceton test might result in a reduction of present rates.

It may not be known to the author of the statement just quoted that insurance rates in coal mining are based on the exhaustive examinations of the companies' own inspectors, who report all the attending conditions existing in a mine, tending either to increase or decrease the liability to explosion. These reports are quite independent of the assumed explosibility or otherwise of the dust, but have reference more particularly to the management of the mine in respect to its safe operation.

SIM C. REYNOLDS, Mine Inspector,  
Houston, Penn.      Aetna Life Insurance Co.

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### Working 3-Ft. Pitching Coal

*Letter No. 3*—As a miner I have had some experience with two features mentioned in Samuel Dean's article, *Coal Age*, Feb. 10, p. 260, and will reply briefly to two of the questions asked in the Foreword in the same issue.

In regard to the style of car to be used in working this seam of coal, let me say that I would prefer a 1-ton car. This car should have a door or low rear-end gate and 12-in. wheels. The track gage should be 36 in. In my opinion, this would make a practical car for use in low coal. Such cars are used largely in this state. The wheels should be equipped with ball bearings so as to reduce the rolling friction to a minimum. In my time, I have used many cars of different sizes and styles and have found cars having a capacity of 1 ton the most convenient to handle under ordinary conditions.

The second item that interested me was the question regarding the kind of coal-cutting machines that should be used in this case. Under the conditions named, I would prefer to use as light a machine as possible, pro-



vided the stratum mined does not contain too much sulphur. The Ingersoll-Rand "Radialaxe" machine is a good one for this purpose. The machine is light to handle in low places and is operated with air. W. T. HALE.

Crawford, Tenn.

*Letter No. 4*—Responding to the request in the Foreword, *Coal Age*, Feb. 10, to discuss several points in connection with Samuel Dean's paper on page 260 of the same issue, I submit the following:

In answer to Questions 1, 2 and 10, regarding the type and capacity of the car and the track gage best adapted to the working of 3-ft. coal pitching from 10 to 20 deg.—first, under a 12-in. drawslate, with a hard floor; second, under a hard sandstone roof, with a floor that can be lifted by blasting—allow me to suggest that the car should have a capacity not to exceed 1 ton, in order to reduce the expense for brushing to a minimum. When the coal is overlaid with a 12-in. drawslate that falls easily, however, the capacity of the car may be increased to 3000 lb., without serious inconvenience.

#### TYPE OF MINE CAR AND TRACK GAGE

For the type of car, I would suggest a rather unusual construction, in the form of a steel car whose cross-section is a somewhat flattened half-circle or a semi-ellipse. In order to gain headroom, the axle bars could be passed through the inside of the car about 4 in. above the bottom at the center. The drawbar would likewise pass through the center of the car and rest on top of the axles. It should be of sufficient strength to form a part of the frame of the car, supporting the bumpers and resisting the thrust and pull of haulage. While this type of car would require a revolving dump, it permits the lowering of the center of gravity of the load and gives a greater capacity for the same headroom.

The track gage should be 3 ft., and I would suggest that, in order to avoid the tendency of the car to tip forward on a downgrade, the center of the wheel truck should be set slightly ahead of the center of the car, which is a feature adapted to a pitching seam.

By using a 48-in. gage, and increasing the length of the car somewhat, its capacity could be increased to 2 tons with the same headroom. However, such a car would be difficult to handle, unless suitable mechanical means were employed for lowering the car on the incline.

#### COAL CUTTER BEST ADAPTED TO MINING LOW COAL

Regarding the type of coal-cutting machine best adapted for use in working 3-ft. coal generating gas, allow me to say that the state mine inspectors would hardly sanction any kind of electrical apparatus in a gaseous mine. For this reason, a compressed-air machine should be employed. The general type of machine must be determined in accordance with the method used in working the coal and conditions at the face.

Where it is possible to maintain a considerable length of longwall face, a machine can often be set up and run continuously for three or four days without being reset. This will require, however, that the face be free from faults or other disturbances that would interfere with continuous work and necessitate the machine being moved and reset. Where many changes must be made, the efficiency of the work is greatly reduced, as much time is lost in moving and resetting the machine. The difference

is greater in cutting coal on the pitch than in a flat seam, as the machine is more easily moved and reset in the latter case.

The English type of longwall machine, in which the cutter bits are mounted on a disk, is well adapted to making a continuous cut, but the operation is not so economical as in chain machines. The former type of machine is not used, to my knowledge, in this country. In Europe, where it is used, it makes a cut from 3 to 5 ft. deep.

The American chain type of coal cutter does the same work and possesses the advantage of making a deeper cut, for the same weight of machine. The longwall chain machine, with a swing cutter-bar that enables it to travel in a narrow space along the face of the coal, is best adapted for this work.

#### IGNITION OF GAS BY SPARKS NOT IMPOSSIBLE

In answer to the fourth question, in regard to the possible or probable ignition of gas, through the action of the cutter bits, I am inclined to think that ignition is more likely to occur in the use of electric machines than when the machine is driven by compressed air. I know I have seen more sparking at the bits of electric cutters than in compressed-air machines. I have thought that it was due rather to the sparking of the current than to the steel bits striking the coal, but I have no proof that this is the case.

In answer to Question 5 let me say that, while it does not seem impossible for gas to be ignited by a spark struck by a miner's pick coming in contact with a sulphur ball, I regard the chances of such an occurrence as being quite remote, since I have never seen this take place.

#### GRAVITY HAULAGE AND DRAINAGE SYSTEM

Regarding the method of haulage to be used (Question 6), let me say that advantage must be taken of the pitch of the seam. In other words, the location of the shaft with respect to the workings must be such that the coal and water will gravitate to the shaft bottom. This will, of course, increase the length of haul over what would be required for a central location of the shaft; but the advantage gained by a gravity haul and good drainage will more than compensate for the greater distance.

The roads having a good sandstone roof will not require much attention in the way of timbering. The main roads on each side of the shaft should be driven practically on the strike of the seam, allowing only a sufficient grade for natural drainage toward the shaft. Slant roads are then started off the main roads a short distance from the shaft bottom and driven, at an angle of 45 deg., to the rise of the strike of the seam. Main roads are then driven, from each end of the shaft pillar, on the full pitch of the seam or at right angles to the strike.

This arrangement will give two main roads driven on the strike, two on the full pitch of the seam and two slant roads, and will provide easy access to every portion of the working face.

Rope haulage can be used on the two strike roads, while it will be possible to employ gravity haulage on the other roads driven up and across the pitch. Many may prefer to use storage-battery locomotives on the two strike roads, however. As usual, working places are turned at regular intervals, making an angle of 45 deg. with the main or slant roads from which they branch.

Replying to Question 7, it would seem that the longwall method is the only one by which this seam can be worked successfully and economically. Longwall work will produce practically all lump coal, which will have a greater market value, whether intended for steam or domestic use. The longwall system will also minimize the danger arising from coal dust and provide the most simple and efficient means of ventilation, which is a most vital consideration in a gaseous mine. Gas and coal-dust explosions are not so liable to occur in longwall as in room-and-pillar workings, and blasting is wholly eliminated in the mining of the coal. This will not only reduce the cost of mining but increase the safety of the mine.

The use of "face conveyors" mentioned in Question 9, it seems to me, would enable all the coal to be loaded on the level roads and, by permitting the use of larger cars, greatly increase the output of coal.

Delagua, Colo.

ROBERT McCUNE.

### Circulation in the Wolf Lamp

*Letter No. 2*—Kindly allow me to make a few suggestions regarding the inquiry of "W.F.L.," *Coal Age*, Jan. 20, p. 165.

As stated in the editorial reply to this inquiry, the Wolf lamp is designed to be ventilated on the Eloin principle. But, while it is true that air enters this lamp through gauze-protected openings at a point below the flame, I quite agree with Mr. Ashworth when he says, Feb. 17, p. 326, "These openings in the ring gauze, however, are comparatively small and so obstructed by the gauze that much of the air supplied to the combustion chamber must enter the lamp through the lower portion of the bonnet." I do not mean by this that air enters the lamp through the top of the gauze where the burnt air must pass out, but just above the glass.

#### PRINCIPLE OF THE ORIGINAL STEPHENSON LAMP

The principle of the Stephenson lamp, referred to in the editorial comment following Mr. Ashworth's letter, is clearly stated in the book "Mine Gases and Explosions"—Beard, p. 219, and reads as follows: "If a lamp could be made to retain some burnt air above the flame and permit the firedamp to come in below in small quantity, to be consumed as it came in, the burnt air would prevent the passing of flame upward, and the velocity of the current below would prevent its passing downward."

This principle undoubtedly is more or less effective in protecting the top of the gauze chimney in the Wolf lamp, but that fact proves neither that the entire gauze chimney is full of burnt air nor that all the air enters the combustion chamber through the ring gauze. In reality, the burnt air in the Wolf lamp can easily be shown to occupy only the upper portion of the gauze chimney. For instance, if the lamp be inverted sufficiently to reverse the circulation within and allow the burnt air to reach the flame the latter is quickly extinguished.

Again, if the openings in the gauze ring below the flame are temporarily closed, there is little effect observable on the flame of the lamp, which continues to burn almost as brightly as before, thus proving that air is entering the combustion chamber through the lower portion of the gauze.

Again, let me say that the smoke test suggested by Mr. Ashworth can be applied better by rolling a piece of paper

into a cylinder. Having closed one end, fill this cylinder with smoke and expose its open end to the lower portion of the gauze. The smoke will be observed to pass in through the gauze and downward close to the glass, until it reaches the flame, when it is seen to ascend in the center of the lamp to the top of the gauze chimney, where it is discharged.

An even more conclusive experiment is to fill a small inverted box with smoke or gas and bring it over the top of the lamp, so that the entire gauze chimney will be within the box while the glass and the gauze ring below remain in fresh air. If the box is filled with smoke, the latter will be observed to pass in through the lower portion of the gauze and descend to the flame as before. On the other hand, if the box is filled with gas, the flame of the lamp will show indications of gas immediately, by the formation of a cap.

These simple experiments prove beyond a doubt that, as far as the Wolf lamp is concerned, much of the feed air enters the combustion chamber through the lower portion of the gauze, while the burnt air discharged through the top of the gauze chimney decreases in quantity from the top downward.

Reversing the experiment last mentioned, and immersing the lower portion of the lamp in a box filled with smoke, some smoke will be seen to enter the combustion chamber; but in much less quantity than previously.

Bluefield, W. Va.

D. H. PERDUE.

### Mine-Accident Record

*Letter No. 13*—I believe that the recording of serious mine accidents should prove a great lesson to all miners who are prone to take unnecessary risks and often laugh at the precautions urged for their own safety. Many fail to profit by the lesson, however, and a man will do the very thing today that caused the loss of his buddy's life yesterday. I want to cite two or three accidents just as they occurred in my own experience when working as a lad some years ago in the mines of France.

The first of these cost a man his life because he disregarded a simple rule. The accident happened on a short incline where the loaded cars were lowered from the face to the gangway. As lads, we could help to lower the cars, which were attached to a rope passing over a headsheave and controlled by a brake.

#### ACCIDENT CAUSED BY A DERAILED CAR

When a car was derailed in passing down the incline, it was the rule to make fast the rope holding the car, by means of two strong chains and clips. The purpose of this was to prevent the car from moving while the men were lifting its front end onto the rails.

On one occasion, when a car was derailed, the rope was made fast by the chains and clips, but the position of the car was such that the taut rope held it and made it difficult for the men to lift the front end. Instead of using a timber to pry up that end of the car, one of the men called to me to loosen one of the clips a little so as to give some slack to the rope. When this was done they lifted the car to the rails and it at once took up the slack, catching the man's head between the car and the crossbar in the roof, crushing his skull and breaking his neck.

Another accident that occurred in the same mine was caused by a man's persisting in an unsafe practice against



which he had often been warned. Although he was frequently fined, he still took the chance of drilling out the tamping of a missed shot. The shots were fired by fuse, and this man would place the "primer," or the cartridge containing the cap, in the end of the hole when charging more than one cartridge. If a single cartridge was used, he would turn down the end containing the cap, so that the drill would not strike the detonator if the shot missed and it became necessary to drill out the tamping.

He did this once too often and the charge was exploded when he attempted to drill the tamping as he had so often done before. The man lived 39 days after the accident. Had he died two days later, however, his family would not have had any compensation, as the French mining law recognizes death as the direct cause of an accident only when occurring within 40 days after the injury was received.

#### SAFETY IN USE OF LONG FUSES IN BLASTING

My father was a very careful man and took every precaution for his own safety and that of the men working with him. When working at the face of a tunnel with two other men as buddies, he was often ridiculed by them for using longer fuses than they thought was necessary. One day he was unable to go to work and his two buddies used shorter fuses to fire their shots.

Before lighting the shots, they had placed their tools in a car close at hand, expecting to push the car back after lighting the fuses. One of the shots, however, went off sooner than they had calculated and, although at quite a distance from the face, they were struck by some flying coal. They at once dodged behind the car to protect themselves from the second shot. As a result of their lack of caution, one of these men was deaf for more than four months, while they were both bruised by flying rock and coal.

#### CAUTION NEEDED UNDER LOOSE ROCK

It was my father's extreme caution that probably saved both of our lives, on another occasion. In company with two other men, we had started to drive a place off a double-track road. The loose roof was first taken down to the solid, giving a height of 10 ft. above the floor. There was a streak of coal about 2½ ft. below the solid rock. Examining the roof carefully, my father found a big crack in the rock above. He put his bar in the crack and attempted to pull the rock down, but, failing in this, we started to drill into the rib just below the coal streak.

While arranging the drill, a small piece of slate fell, striking my leather cap. We stopped work at once and my father again started to test the rock above, but before his bar reached the crack the piece slipped and fell as we ran. It measured 12 ft. long, 3 ft. wide and 30 in. thick. My father stumbled as he turned to run and the end of the rock caught one of his feet over the rail, crippling him for life.

I recall an accident that cost an assistant foreman his life, because he was smart and thought he knew better than the men working for him. It happened as follows: The slopes leading to the first level had been abandoned for a long time and were full of water. In order to reach the coal in that level, it was necessary to drain off the water, and a hole was started from the lower level for that purpose, at a point located by the surveyor. The drilling

was in charge of a competent man who had several men to help him.

A still lower level had been started at the bottom of the shaft, 300 ft. below where the men were drilling. When a little water was observed to drip from the hole, a man was sent immediately to warn the men working in the lower level, as there was no telephone in the mine.

Shortly after, the assistant foreman seeing those men come out of the shaft became angry and hastened to where the drillmen were working. Telling the man in charge that there was no such amount of water as he feared, the foreman seized the drill, saying that he would show them. The drilling boss pushed him back and started to fight, at the same time calling to his men to run for their lives. Then, telling the foreman to stand back, and laughing at him because he refused to move, the drilling boss assisted to push the bar through to the water. There followed a great explosion, as the water broke a very wide opening in the coal. Taken suddenly by surprise, the foreman stumbled and fell as he turned to run. He was found later, at an angle in the road, where he was caught by his clothing and was drowned. The shaft was filled with water, which backed up 500 ft. on the main road.

Peru, Ill.

GASTON LIBIEZ.

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### Cleaning Up a Roof Fall

*Letter No. 8*—I am inclined to think that the blame for this accident rests on the assistant foreman who ordered the work done and did not go with the men or see that it was properly performed.

Most of the clauses of the mining law defining the duties of mine officials state that he "shall direct and see that . . ." The most important part of the act are the words "and see that." The foreman or assistant who obeys this injunction has the consciousness that he has, at least, performed his duty.

Personally, I could not satisfy my own conscience, even if absolved by the law and public opinion, if a man was killed or even injured, in performing a dangerous piece of work by my orders, while I was busy somewhere else in the mine. This is not to say that a foreman or his assistant is infallible, or that he cannot err in his judgment; but that, to the best of their ability, these men should lend their aid in the performance of dangerous work.

I have known men, constantly employed in timbering for a long time, whose conclusions I would accept in preference to my own, because their experience has matured their judgment in regard to the safest and most economical methods to employ in a particular case. Nevertheless, I would rather remain and see the place made safe where they must work.

On the other hand, there are many men who, when applying for work, pretend to have a knowledge or experience that they do not possess. For example, recently, a man who asked me for work claimed he had run a Sullivan shortwall mining machine two years before that machine was on the market. Later, the man showed that he did not even know how to set the machine properly for cutting the coal. The same is true in every line of work. It is generally the case that the "floater" knows everything.

Foremen should encourage men to train for the work they are to do. The helper of a timberman or a track-layer should be made to feel that he will be given charge



of the same work later. A brakeman should be encouraged to feel that he will some day be given a place as motorman. Such training makes experienced men.

Masontown, Penn.

J. O. DURKEE.

*Letter No. 9*—While I think that it would have been better had the assistant foreman cautioned the men to take down any loose top and make themselves safe before starting to clean up the fall referred to by "Miner," *Coal Age*, Jan. 20, p. 165, I do not think that he was in duty bound to repeat these instructions to men who are supposed to understand such work.

The Bituminous Mine Law of Pennsylvania, Art. 4, Sec. 6, makes it the duty of the mine foreman to "see that no person is directed or permitted to work in an unsafe place, unless it be for the purpose of making it safe." The men sent to do this work may be assumed to be experienced timbermen and are not to be classed with miners, who must be instructed "as to when, where and how timber shall be placed so as to avoid accidents from falls and, also, in a general way, how to mine coal with safety to themselves and others," as specified in Sec. 10 of the same article in the bituminous law.

I agree with the suggestion made by other writers, that this assistant foreman regarded the men he sent to do the work as capable of performing it with safety to themselves. The men generally employed for this class of work are experienced men and know that there is always loose rock overhanging a fall. Such men would not fail to first make themselves safe.

SAMUEL JONES,

Madera, Penn.

Mine Foreman.

## Textbooks in Examination

*Letter No. 15*—The suggestion that examining boards allow the use of textbooks in examination is a little confusing to my mind, because it would be placing in the hands of candidates the opportunity to copy the answers to the questions asked.

Looking back to the time when I passed the examination for mine foreman, I remember the difficulties experienced and how I passed with a close margin. My textbooks and formulas were all at home and were, of course, of no use to me in Room 28, in the Court House, at Pittsburgh. It is needless to say that I was very much tangled up in some of the technical questions, but my practical experience enabled me to obtain a passing mark.

Being now in my 44th year of coal mining in the mines of Europe and this country, I have had the acquaintance of some of the ablest mine managers who, like myself, had to take the examination without the aid of any textbooks. In 1908 I tried the examination for mine inspector, but failed because I could not handle the technical problems asked in the examination.

In my opinion, the opportunities offered young men for education, at the present time, are so inviting that they should be encouraged to study and take advantage of the night schools taught by trained men and school professors. Young men who will avail themselves of these opportunities belong to a class that will not and cannot be held back, if they have anything to work for. The allowing of textbooks in examination would take away the incentive to study from these men and would give younger men the advantage over those who are older and have had more practical experience.

My conclusion is that if a man is not fit to pass an examination without a textbook at his hands, he should not undertake the examination, but should devote himself to study and reading, until he is fully prepared to answer the questions that are commonly asked.

West Leisenring, Penn.

ROBERT W. LIGHTBURN.

*Letter No. 16*—The question of the examination of candidates for the positions of mine foreman and fireboss is often a discouraging one, and I have asked myself many times whether the small increase in the pay allowed a mine examiner (fireboss) is worth the time and effort he has put forth in gaining his position.

If I am correctly informed, the pay of a mine examiner in this state is \$3.55 for each day the mine is working. When the mine is idle the man loses a day, which I believe is the general rule in nongaseous mines. Compare this with the pay of drivers, who receive \$3 a day and are allowed extra time; furthermore, they are burdened with no responsibility such as is the lot of the mine examiner. Moreover, the driver does not need to study and fit himself for an examination before he can take up his work.

My lot, like that of many others, has been a hard one, as far as education is concerned. I started work in the mines at 9 years of age, and most of my education has been received through night schools whenever this opportunity was offered, which was not always the case in mining villages. Notwithstanding these difficulties I have always had an ambition to learn.

In regard to the question of allowing textbooks to be used in examinations, it is my belief that men should be able to pass an examination on their own unaided merits. If they cannot do this, they should not be granted a certificate.

The suggestion that a small memorandum book be prepared containing the formulas and constants required in answering technical questions, however, is a good one. Such a memorandum book could be carried in the pocket and would be a great help to one who is studying for an examination, as he could refer to it in odd moments when he is away from home. I feel that a man should be able to work the different problems that arise in mining without referring to a textbook, as he cannot always have that with him when it is necessary to work out such problems.

—, Ill.

STUDENT.

The discussion department of *Coal Age* has grown to such proportions that it has, for some time past, been a practical impossibility to publish all of the letters contributed by interested readers. On this account it has been found necessary to close the discussion of some subjects while they are still attracting much attention, judging from the number of letters received. An occasional exception to this rule will be made in favor of contributions coming from a great distance.

It happens, at times, that a subject attracts more attention than its importance warrants, because of its strong appeal to practical mining; and the same is true of some topics relating to theory and principles. These must give place more quickly to subjects of greater significance.

In addition to those announced last week as closed or closing, the subjects "Shortage of Labor," "Cleaning Up a Roof Fall" and "Textbooks in Examination" will close with the letters now on hand and yet to appear.—Editor.

## Inquiries of General Interest

### Market Classification of Illinois Coals

Kindly describe or outline the territory from which "Southern Illinois coals," and "Standard District coals" come, and state if there are any state or Government geological reports using these names and designating and outlining such coal fields, and in what publications this information can be found. I want to ask, also, To what extent are these terms "Southern Illinois coals" and "Standard District coals" used commercially?

St. Louis, Mo.

INQUIRER.

In response to our request, a correspondent, whose acquaintance with the commercial end of the coal industry enables him to speak from experience in the handling of classified coals, writes as follows:

Owing to the fact that coal classified as "Southern Illinois coal" has a reputation for being of exceptionally

term "Southern Illinois coal" means only coal coming from Williamson and Franklin Counties. Coal mined in the southeastern section of the state, that is in Saline County, is classified in the coal markets as Harrisburg coal, while in contracts it is specified as "Saline County coal."

Coal mined in the vicinity of Murphysboro, in Jackson County, is always designated in coal-trade circles and in contracts as "Big Muddy coal." There are a couple of mines in Jackson County, near the outcrop of the No. 6 seam, producing coal that is generally classified as "Duquoin coals," but their tonnage is small and they are not a factor in the general business. "Duquoin coals" refer generally to the coals mined from what is known as Sunfield, to the south of De Soto, although the "De Soto" and "Hallidayboro coals" take a higher rate than "Duquoin," in St. Louis and Chicago markets.

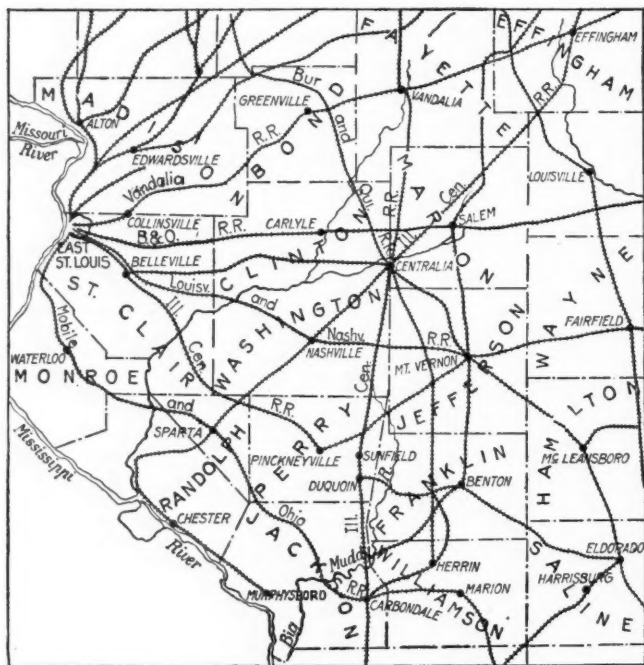
In the Duquoin field in Perry County there is a wide variation in the quality of the coal mined, causing some operators to classify their product as "Franklin County vein" and "Southern Illinois coal," but none of these coals have the same characteristics as the coals from Williamson and Franklin Counties, although a good coal from Duquoin is much better in some respects than inferior coal from both of these counties.

The so-called "Standard District" begins on the south at Pinckneyville and Willisville, in Perry County, and extends north and northwest through Randolph, Monroe, Washington and St. Clair Counties, and the southern portion of Madison County, as well as the western portion of Clinton County.

The coals in Clinton County, however, are rated, in quality, above the Standard District coals. They are really superior to and should not be classified as "Standard." The same remark will apply to the coals mined in the southern portion of Madison County. Madison County, in general, is classified as belonging to what is known as the "Mt. Olive" or "Staunton field," which comprises, in addition to Madison County, the counties of Bond, Macoupin, Montgomery and, in a general way, as far as the St. Louis market is concerned, most of the mines in the southern section of Christian County.

In connection with the Standard field, in the sales markets, the coals from Clinton County always bring a higher price on account of their quality than the coals in the other counties, with the exception of Madison County. These prices in some instances are higher than the prices obtained from the better grades of coal in the Mt. Olive or Staunton field.

In conclusion, it is generally understood, in coal-trade circles, that Southern Illinois coal is coal from Williamson and Franklin Counties, and the Standard District comprises all coal coming into St. Louis on the 57½¢ freight rate, with the exception of the Mt. Olive field, which is designated as such. All other coals coming in on intermediate rates are classified as intermediate coals, but they are a small factor in the market.



MAP OF SOUTHERN ILLINOIS COAL FIELD

good quality, many operators with properties on the edge of the field have protested strongly against the Government or state designating by outline the territory where such coal is mined.

As a result of these protests, the Geological Surveys of the state and Government have refused to define the territory by any exact outline or boundary. It is there defined only in a general way as indicated by the term applied. There are no publications of which I have any knowledge or that I have ever seen that will give any definite outline of the territory for Southern Illinois coals.

In some reports published a few years ago by the Illinois State Geological Survey, Southern Illinois coal was considered to be coal that was mined in Williamson and Franklin Counties. In the coal trade circles, the



## Examination Questions

### Indiana Firebosses' Examination Held Sept. 15, 1916

(Selected Questions)

*Ques.*—What is firedamp?

*Ans.*—Firedamp, as its name indicates, is any inflammable or explosive mixture of air and gas. The term "firedamp" is often wrongly applied to undiluted marsh gas.

*Ques.*—What is the lowest explosive point of firedamp?

*Ans.*—Assuming the firedamp mixture is simply marsh gas ( $\text{CH}_4$ ) and air, no other gases being present, the proportion of gas to air at the lower explosive limit is 1:13, or 1 volume of gas to 13 volumes of air. The mixture will then contain 7.14 per cent. of gas.

*Ques.*—What is the highest explosive point of firedamp?

*Ans.*—Assuming the same conditions as stated in the answer to the previous question, the higher explosive limit of the mixture is reached when the proportion of gas to air is 1:5, or the mixture contains 10.67 per cent. of gas.

*Ques.*—What is the maximum explosive point of firedamp?

*Ans.*—The maximum explosive point of a mixture of pure marsh gas and air is reached when the proportion of gas to air is 1:9.57, or the mixture contains 9.46 per cent. of gas.

*Ques.*—What effect, if any, does mixing carbon dioxide with firedamp have?

*Ans.*—The addition of carbon dioxide ( $\text{CO}_2$ ) to a firedamp mixture has the effect of reducing its inflammability or explosibility. A mixture of pure marsh gas and air at its maximum explosive point will be rendered explosive by the addition of one-seventh of its volume of carbon dioxide.

*Ques.*—What effect, if any, does mixing carbon monoxide with firedamp have?

*Ans.* The addition of carbon monoxide ( $\text{CO}$ ) to a firedamp mixture increases both its inflammability and explosibility; or, in other words, widens the explosive range of the mixture.

*Ques.*—What effect, if any, does bituminous-coal dust suspended in the mine air have on an explosion of firedamp?

*Ans.*—The finely divided dust of bituminous coal, suspended in the mine air and acted on by a flame of sufficient volume and intensity, is burnt with explosive rapidity. In case of a local explosion of firedamp in such a dusty atmosphere the combustion of the dust will have the effect of extending the flame and propagate the explosion throughout the mine, the dust-charged air itself becoming explosive.

*Ques.*—What is afterdamp?

*Ans.*—Afterdamp is the variable mixture of air and gases remaining after an explosion of gas or dust in a mine, the mixture being irrespirable and dangerous.

*Ques.*—What gases are found after an explosion of firedamp at its maximum explosive point?

*Ans.*—The explosion of a mixture of pure marsh gas and air at its maximum explosive point produces carbon dioxide ( $\text{CO}_2$ ), water vapor or moisture ( $\text{H}_2\text{O}$ ) and nitrogen ( $\text{N}_2$ ), as a result of the reaction that takes place between the marsh gas and the oxygen of the air, while the nitrogen of the air remains unchanged, the quantity of air being just sufficient for complete combustion.

*Ques.*—Suppose that there were 20 men working in rooms off the 3- and 4-E. main north, and when making an examination as fireboss in the morning you found a large accumulation of gas in rooms Nos. 2, 3 and 4 on the 4-E., that entry being the intake; how would you proceed to remove the gas and what precautions would you take to prevent an accident?

*Ans.*—A fireboss cannot afford to take any chances on the removal of a large body of gas that he finds accumulated in three rooms near the mouth of the intake of a pair of entries. He must, of course, use his best judgment in respect to permitting the men working in other sections of the mine to enter and proceed to their work. Under no condition, however, should men be permitted to enter the pair of entries in which the gas has accumulated, or to work in any portion of the mine ventilated by the air returning from that section. If there is any danger of roof falls driving the gas out into other portions of the mine, it would be unsafe to allow any men in the mine, except the men required to perform the work, until the gas has been removed and the mine again examined and reported safe.

Having excluded all the men from the return current outby from the point where the gas has accumulated, the first step is to guard all entrances to the return current. Having done this, use some means to increase the circulation of air in the affected portion of the mine. Then, starting at the mouth of the 4-E. entry, proceed to examine room No. 1, and if this is clear of gas begin the erection of a brattice that will deflect all the air current passing on the entry and cause it to sweep the working faces in Rooms 2, 3 and 4, where the gas is accumulated, assuming that these rooms are level and connected by breakthroughs at or near the face.

Only experienced men must be employed in this work and none but safety lamps of approved type used. Tests must be made, from time to time, to determine the progress of the work. Should the breakthroughs not be close enough to the face of the coal, it may be necessary to extend a line of brattice to the face of each room, in succession, as the gas is driven out.

When possible to short-circuit the air by setting open a door between the two entries, the work will be expedited, as the gas will not be carried through all the rooms on these entries but will pass out more quickly onto the return. After removing the gas, the mine, or that section of it from which the gas has been removed, must be carefully examined before permitting the men to enter for work.

# Coal and Coke News

## Washington, D. C.

The general coal land leasing bill which has been pending in conference between the House of Representatives and the Senate will fall of passage with the expiration of Congress on Mar. 4. Despite the many attempts of the officials of the administration to reach a compromise on this measure it was impossible to break the deadlock which existed between the two houses and it will be necessary to begin the fight all over again when the new congress meets.

The bill, when it passed the House, was a measure providing for a method of leasing coal, oil and other lands belonging to the Government. The Senate eliminated the coal land leasing provisions completely and passed a bill relating only to oil lands. Thereupon arose a great controversy over the California oil land leases. The Secretary of the Navy desiring to retain these deposits for the future use of the navy whereas many California interests desired to provide a means for private development. The deadlock between the House and Senate arose over the provisions relating to the methods for granting leases to private operators. The House desired to retain this authority in Congress, whereas the Senate desired to give executive officers of the Government authority to grant leases.

While the general bill failed, one private coal land leasing bill commanded favorable action. At the present writing this has been agreed upon in conference and it now requires but the final sanction of the two Houses to the conference report, which the sponsors of the measure are confident will be given before the Congress expires by limitation. This measure, in the form of a joint resolution authorizes the Secretary of the Interior to lease to the Republic Coal Co., a corporation of Montana, certain coal deposits in Musselshell County, Montana.

The intent is to permit the Republic Coal Co. to take coal from these lands for the use of the Chicago, Milwaukee & St. Paul R.R.

### New Classification of Mines

In order to have information with regard to mines producing coal in a form which will be of most service to the War Department, in case it should call for it, the Geological Survey is rushing a re-compilation of its list of coal mines. At present, coal mines are classified as to states. They are now to be classed, in addition, on a railroad basis. In time of war, it would be necessary to have information regarding all the mines along a certain line of railway. Even under normal conditions there is frequent demand for this information and such a reclassification of the coal mining lists of the Survey has been under contemplation for some time.

The War Department would have to rely heavily upon the Geological Survey for information as to the production of coal and other minerals in case of war. The only complete information regarding these matters possessed by the Government is in the hands of the Geological Survey. It is recognized that one of the most necessary steps which would have to be taken, if active military operations should become necessary, would be an arrangement whereby all by-product coke ovens could be kept continuously supplied with coal. Since the Survey has complete information as to the sources of supply for all by-product ovens, it would be in a position to be of material aid to the War Department in case the mobilization of the country's resources should be demanded.

Insistent demand for more detail in the monthly coal statement issued by the Geological Survey will be complied with to as great an extent as possible in the future. In showing the points of origin of coal, it is necessary to make arbitrary grouping of states, due to the fact that the data is furnished by railroads. Thus it is necessary to show in one group the coal originating in the states traversed by the same line of railroad as it is impossible to secure a grouping by states from the railroads when it is necessary to have the information as promptly as required for the monthly coal statement.

A greater tonnage of coal was mined during January than in any other month in the history of the industry, according to C. E. Lesh, statistician of the United States Geological Survey. None had predicted that the record breaking tonnage of January, 1916, would be surpassed. January of this year had the advantage of one working day more than did January, 1916, but, on the other hand, congestion on some railroads caused a considerable reduction in production that otherwise would have been made. The congestion in Pennsylvania was so severe as to be mainly responsible for a decrease in the production of that state during January of this year as compared with January, 1916.

## HARRISBURG, PENN.

Preparatory to the introduction of an all-embracing revenue bill imposing a state tax upon anthracite and bituminous coal, upon products from all quarries, gas and oil wells, etc., in Pennsylvania, Attorney General F. S. Brown, will get into communication with authorities in other states in order to present information to the state revenue commission on how the problem is met elsewhere.

The Attorney General at a meeting held recently with the joint legislative revenue commission, informed the commission that the Davis bill, now in committee, imposing a tax of two and a half per cent. ad valorem upon bituminous and anthracite coal is a constitutional measure, and if enacted could without question be enforced.

Preliminary discussion of a coal tax led to the understanding by the commission that the Davis bill will make way for a measure which will impose a tax upon oils, gasoline and quarry products, as well as upon coal. The experience of West Virginia in raising much of its revenue by taxing such resources will be detailed to the legislative commission at its next session. Practically all of the tax will be upon the value of the product as marketed.

Senator W. C. Sproul, chairman, of the revenue commission, declared himself as favoring a tax upon the state's resources, with a distribution of a portion of the tax to the community in which the tax is imposed. The importance of such a legislative step to the anthracite region especially, which is demanding some relief from property destruction caused by the production of its mineral wealth, cannot be overestimated.

Representative M. A. Milliron, of Armstrong, where bituminous coal is produced, declared that the bituminous operators cannot well oppose a tax upon their products, especially at this time, when fortunes are being made in the coal business.

The commission is disposed to regard the tax with a distribution feature as favorable.

That a tax upon coal will be enacted seems quite certain, also that this tax will not be so large as those under the attempted Roney and Dawson acts.

Jefferson W. Smith, of Philadelphia, has introduced a bill, to repeal the Dawson coal tax act of 1915. Representative Dawson insists that there is a chance that his act may be held to be constitutional by the Supreme Court, and that the attempted repealer has strengthened his opinion in this respect.

Representative David Fowler, Lackawanna County, has presented a bill in the house requiring the Department of Mines to print the report of the Anthracite Mine Cave Commission that was appointed by Governor Tenor in 1911.

This report was never printed by the commission, and but few typewritten copies are in existence. The commission's report is a resumé of the history of the anthracite region, of the existing contracts between mineral and surface owners and a report on the physical conditions with respect to the question of surface support.

There is a great demand for this report, but there was no provision made for the printing of the commission's findings. As it was the commission had to dig down into its own pockets for about \$5000 to make up a deficiency in appropriation. By special act of the legislature in 1915 the members were reimbursed for this amount.

Representative Ramsey, chairman of the House Committee on Mines and Mining has introduced the anthracite code as prepared by Hon. James E. Roderick, chief of the Department of Mines.

Mr. Roderick declares that he has introduced the code at this time because of his anxiety to reduce fatalities in and about the anthracite mines. The fatalities in and about the anthracite mines are about 40 per cent. higher than in the bituminous mines, and the chief of the department of mines states there is no valid reason for this great disparity in fatalities in the mining of hard and soft coal. The fatalities in the bituminous mines are higher than they should be, although the new law of 1911 has been the means of effecting a great reduction.

The fatalities among the anthracite employees are about 50 per cent. higher than they should be and to reduce the number, radical changes must be made in the mine law so that greater protection can be given employees.

A commission to revise the anthracite mine law was appointed by the Legislature in 1911, and presented a revised code to that body in 1913, but owing to a decision of the Supreme Court that no damages could be collected from an operator if a life was lost through the negligence of the mine foreman, the proposed code did not become a law. In preparing the present code no thought was given to the question of

collecting damages, but to obtain legislation that would help to lessen the loss of life.

At the session of 1915 the mine foremen's clause was amended and the Compensation Act was passed which provides compensation for practically all accidents about the mines. The argument, therefore, that prevailed against the passage of the revised code in 1913 is not valid against the code now in the hands of the mining committee.

Mr. Roderick's long experience in practical mining and his 18 years as head of the State Department of Mines will no doubt have some weight with the committee, as to what is needed to safeguard the health and lives of the mine workers.

It is believed that an anthracite mine law properly prepared to meet existing conditions and strictly enforced in all its provisions relating to the duties of superintendents, mine foremen, assistant mine foremen, etc., under the rigid supervision of the state inspectors, would reduce accidents in and about the anthracite coal mines by 50 per cent. To that end, Mr. Roderick states that he has spent considerable time and study in the preparation of the code, and that its general provisions are partially covered by the report of the commission in 1913. It has been re-written and modified in such a way as was deemed best to meet present conditions and give the greatest protection to employees. In the preparation of the code, the chief of mines says that he did not ask or receive any suggestions from inspectors, mine officials, mine workers or their representatives. It was prepared "with one object in view—the reduction of accidents in and about anthracite mines."

It is declared by Mr. Roderick, that one of the present needs is a closer supervision over the actual operation of mines on the part of superintendents, mine foremen, assistant mine foremen and firebosses. The law of 1891 provides that every working place shall be examined by an official once every alternate day, which means three times a week at the most. The code now before the house, provides that every working place shall be examined by an official twice a day, once in the forenoon and once in the afternoon, or 12 times a week.

The code contains many new articles relating to boundary pillars, electricity, inspection by employees, duties of miners, first-aid and rescue corps, regulation of explosives, regulations for oils, etc., and provides for the appointment of inspectors.

## PENNSYLVANIA

### Anthracite

**Hazleton**—Nineteen fatalities making 14 widows and 47 orphans occurred in the 16th anthracite district during 1916, according to the first annual report of Inspector John T. Stickler, recently made public. Thirteen of the men were killed within the mines, and the balance outside.

The suspension of about 2000 shrapnel makers in a local munition plant because of this plant's inability to secure materials will, to a certain degree, relieve the labor scarcity in this vicinity. Operators recently stated that there are places for every idle man and that the output of anthracite will be increased.

The Evans Coal Co. has acquired property near Beaver Meadow from the Lehigh Valley Coal Co., and plans for the erection of a breaker.

**Reading**—The South Mountain Land Co., of Carlisle, has brought suit against the Philadelphia & Reading Coal and Iron Co. to recover \$437,000 and another sum not yet ascertained, in the neighborhood of \$30,000, for alleged violation of a contract whereby the plaintiff leased to the Coal and Iron company ore lands, containing 9051 acres.

### Bituminous

**Blairsville**—State Mine Inspector Crocker of the Thirtieth Bituminous district announces that the production of the district in 1916 was 5,917,295 an increase over 1915 of about 347,000 tons. The Ebensburg Coal Co. plant at Colver was the heaviest producer with 934,898 tons.

**Uniontown**—The sale of immense tracts of J. V. Thompson's coal holdings in Greene and Washington Counties are expected to be made as the result of the decision handed down by Judge J. Q. Van Sweringen, in the Fayette County court on Feb. 19. By that decision the court upheld the right of the Thompson receivers to dispose of at private sale 202 acres of Greene County coal land to Joseph G. Butler, Jr., Youngstown, Ohio, and also authorized the receivers to execute and deliver the deed for the coal to the purchaser. The coal was sold at the rate of \$250 an acre. An appeal has been taken from the decision of Judge Van Sweringen to the Supreme Court, the question involved be-



ing the same as in a previous case which was appealed, and is now with the State Supreme Court—that of personal receivers.

**Somerset**—There was a decrease in the production of coal in the Twentieth Bituminous district during past year as compared with 1915 of over a million tons according to the report of the Inspector of the district, Fletcher W. Cunningham. The production for 1916 was 4,585,076. Car shortage and local strikes were the causes of the decrease.

**Charleroi**—C. W. Braznell, a Pittsburgh coal operator, has purchased 112 acres of coal and surface from the Crawford heirs near West Brownsville. The price is said to be about \$150,000. Mr. Braznell has also purchased some surface from the adjoining farm of C. W. Thompson, for sidings, etc., and operations will start shortly.

**Connellsville**—During the week ended Feb. 17, the Connellsville and Lower Connellsville region produced an aggregate of 306,644 tons, of which 289,774 tons were shipped. The furnace interests produced 182,233 tons, and the Merchant ovens 134,391 tons.

**Milford Station**—The boiler house of the Macgregor Coal Co. was recently destroyed by fire of unknown origin. The loss is estimated at several thousand dollars, which is partly covered by insurance. The Macgregor plant is being operated by C. F. Roy & Bro., and was formerly known as the Bando mine. The boiler house will be immediately rebuilt, but several men will be out of employment for a few days.

**Johnstown**—District Forester Walter D. Ludwig is formulating plans for the reforestation of waste lands in Cambria, Blair, and Indiana counties. He is interesting water and mining companies in the work. Two of these companies are planning to plant a large number of trees during the coming spring and summer.

**Washington**—Two coal deals were recently closed in Washington County. The Midvale Steel Co., which recently purchased the Marianna workings of the former Pittsburgh-Buffalo Co., bought 116 acres of coal land from the Henry Bigler heirs in West Bethlehem Township, paying \$350 per acre. A tract of 124 acres in Independence Township owned by the Brown heirs was sold to the Duquesne Coal and Coke Co. of Pittsburgh, the consideration being \$20,500.

**Pittsburgh**—Graft Bros., coal operators of Blairsville, have purchased from the Latrobe Coal Co. and the H. C. Frick Coke Co., about 800 acres of coal in Derry Township of Westmoreland County. It is planned to electrically equip the plant.

#### WEST VIRGINIA

**Weston**—On account of the scarcity and the high price of small mules the operators at Austin, Red Rock and Potter will substitute Shetland ponies in the low vein mines.

**Williamson**—The Acme Construction Co. recently concluded a contract with the Borderland Coal Co. to erect 23 brick offices and mine residences, to cost \$39,000, the contract to be fulfilled during the spring and summer. These are among the first brick buildings to be put up at a coal operation in this vicinity. These buildings will be constructed in a thorough and workmanlike manner throughout.

**Fairmont**—Three hundred steel coal hoppers built on railroad specifications by the Pullman company of Chicago, have been purchased by the Monongahela Valley Traction Co., to be used in the transportation of coal from the company's mine at Baxter. Delivery of these cars is promised for May, but it is expected that some of the cars may be delivered as early as in March.

**Moundsville**—The mine of the Wheeling Steel and Iron Co., resumed operations recently after having been closed for several days because of a fire which started in one of the workings nearly 7 mi. from the mouth of the mine. Almost 150 men were employed in this operation, which supplies coal for the company's steel plant throughout the Wheeling district.

#### ALABAMA

**Yolande**—The Yolande Coal and Coke Co. is still sinking drill holes near Yolande, Tuscaloosa County, preparatory to opening a new mine adjacent to Yolande Nos. 1 and 2.

**Corona**—The Corona Coal and Iron Co. is opening a new mine near its other operations on the Southern Ry. near Corona, and expects to be getting coal from the operation by about July.

**Birmingham**—Interest is being manifested in the final disposition of the properties of the American Coal Corporation, which was placed in bankruptcy last year. Proceedings looking to the operation of these mines or the sale of the property will be taken up in Federal Court at an early date. These properties are located near Warrior, Jefferson County, and are considered valuable.

#### KENTUCKY

**Richardson**—The Nats Creek Mining Co., with general offices at Cincinnati, Ohio, has completed its operation and will begin shipping coal shortly. This is a high-grade coal and measures an average of about 80 in., all clean coal.

**Frankfort**—There was no representative of the coal operating interests present on Friday, Feb. 23, to appear before the Legislature in regard to proposed new tax laws. This was taken to mean that the coal operators acquiesce in the general terms of the measures as recommended by the Special Commission. It has been proposed, however, that a license tax on coal production shall be assessed and later on, if this measure takes shape, the coal interests will be heard in this connection.

**Whitesburg**—W. H. Potter of Kona Station, Ky., has just closed deals on the Susan Osborne, J. W. and Sam J. Wright coal land tracts comprising about 2000 acres lying along the headwaters of the Kentucky River in the main Elkhorn coal field. While the consideration was not made public it is said to approximate \$100 per acre. Some time ago Mr. Potter purchased the A. Potter coal tract of 500 acres adjoining, and this will give him about 2500 acres in one block—some of the richest undeveloped properties in the Elkhorn coal fields. It is stated that Mr. Potter will make immediate arrangements—on a lease—for the development of the newly purchased properties, containing at least three good workable beds, and that the work will start this spring.

**Hazard**—The Four Seams Collieries Co., Buffalo, and the Kenmont Coal Co., at Buckeye, near Hamdin, Ky., recently made their initial shipments. Each of the plants will now mine and load about 700 tons daily, pending an increase in their output to be made within the next 60 days. At that time they will be shipping about 1000 tons each.

#### OHIO

**Flushing**—The demand for miners' houses in this vicinity is strong. The Dillon mine No. 5 at Black Oak recently contracted for 25 new dwellings. The Holloway Coal Co., at Buckeye, is repairing all of its property and will erect 25 new houses in the spring.

**Jacksonville**—It is reported that the Jones interests are preparing to take over and start operations on the Coe property, near this place, on a tract of about 450 acres, underlaid with a vein of No. 6 coal. There is a mine at this place working the same bed, but it is probable that a new opening will be made. The coal is said to be the finest in the Hocking field.

**Misco**—The Tropic Mining Co. is planning extensive improvements to its mine at Rose Farm, as it is understood that tests have shown enough coal in the vicinity to keep the plant supplied for years.

**Lancaster**—A cave-in on the property of the Roseville Brick Co. is said to have uncovered a bed of coal 4 ft. thick, and probably of considerable extent. The company will likely work the measure to meet its own fuel requirements.

**Columbus**—The Modern Coal Co. of Columbus, a stripping operation in the No. 8 field of eastern Ohio has been sold to a Pittsburgh syndicate which will consolidate it with several other stripping operations in the same region under the name of the Wayne Coal Co. The plant of the Modern Coal Co. was one of the best of its kind in the district and has been in operation for almost two years and has proven a success in every way. Possession to the plant was surrendered Mar. 1.

#### INDIANA

**Petersburg**—The Riverside coal mine, 8 mi. north of this city, which has been closed for years, and allowed to fill with water, has been pumped out and will shortly resume operations.

#### ILLINOIS

**Benton**—The tonnage from 20 commercial shipping mines and one developing mine shipping railroad coal for January in Franklin County was 1,110,617 tons. The largest tonnage from any one mine was the Old Ben Corporation No. 8 with 113,049 tons. The Old Ben mine No. 9 with 108,317 tons was second, and that company leads all other producers in the county.

**Marion**—The property of the Watson Coal Co. was sold at auction here recently for \$15,500 to the Herrin Coal Co. of Herrin, Ill. The Watson Coal Co. in January went into voluntary bankruptcy with listed liabilities of \$25,000. The property was appraised at \$12,500. In addition to the Watson mine the company owns 600 acres of coal rights near Whitesash.

**Beleville**—Fire destroyed the locker room and wash house at what is known as the Nigger Hollow mine of the St. Louis & O'Fallon Coal Co. near French Village early one morning recently. The pit clothes of the 600 men employed at the mine were destroyed. The origin of the fire is not known.

**Carlinville**—The 300-hp. engine at the Carlinville Coal Co. plant blew out a cylinder head recently, necessitating the closing down of the plant. The engine was used to drive the generator that furnished the electric current for the motors in the mine. Coal for local use was supplied from the storage bin but the company was unable to supply coal on contract until current could be obtained from the Illinois Traction Co.

**Springfield**—Governor Lowden's consolidation bill went through the Senate a short time ago by the vote of 42 to 0. The House demurred to

certain amendments made by the Senate and a conference committee of the two branches was appointed. The differences were not radical and an agreement, it is believed, will be quickly reached. The measure will then go to the Governor for his signature. The bill creates a Department of Mines and Minerals, in which will be consolidated the various boards and commissions now in existence dealing with mines and mining.

#### COLORADO

**Laveta**—Fourteen men were entombed in the Oakdale coal mine near this place recently by the explosion of a pocket of gas. Eleven miners succeeded in escaping, but three remained behind the rock fall resulting from the explosion. The property is owned by the Oakdale Mining Co.

#### Personals

**John R. McDonald**, who has for several years been in charge of the mines of the Franco-Canadian Collieries, Ltd., has resigned as technical manager of the company.

**L. B. Gongaware**, of Dunbar Penn., engineer and draftsman for the West Penn Railways Co., has resigned that position to accept a similar one with the H. C. Frick Coke Co., at Scottdale.

**Julius Bierach**, sales manager for the St. Bernard Mining Co., at Louisville, Ky., is ill and is spending some time under the care of his son who is a physician, living at Salem, Ind.

**Alexander K. Mairn**, formerly sales manager of the Hess-Bright Manufacturing Co., Philadelphia, Penn., has been recently made general sales manager of the Gurney Ball Bearing Co., of Jamestown, N. Y.

**E. G. Ridgeway**, for some years past, sales manager of the St. Louis office of George G. Pope & Co., of Chicago has resigned, effective Apr. 1, to associate with the Peabody Coal Co.'s interest in St. Louis.

**M. C. M. Hatch**, superintendent of fuel service of the Delaware, Lackawanna & Western R.R., has resigned to accept a position as assistant to the president of the Locomotive Pulverized Fuel Co. of New York.

**E. T. Kohl**, for some years advertising manager of the Columbian Rope Co., of Auburn, N. Y., recently resigned that position to take up other duties for a large steel corporation with general offices in New York City.

**Walter Woodford**, president of the River & Rail Coal Co., with offices in Cleveland, Ohio, is being talked of as republican candidate for governor of that state. He was formerly vice-president of the Pittsburgh Coal Co.

**Charles W. Moss**, vice-president of the Weaver Coal Co., Buffalo, slipped on the ice one day lately while alighting from a train at his home in Lockport and broke the small bone of his lower leg in two places. It will take about two months for him to recover.

**Earl V. Garrett** recently resigned his position as civil engineer with the Pocahontas Consolidated Collieries Co. and will take charge of the development work of the Annon Pocahontas Coal Co. This is a new firm being formed, the principal promoters being Mr. Garrett and Charles S. Minter.

**Frank N. Erb**, formerly superintendent of production of the R. D. Nuttall Co., has severed his connection with that company and will open an office in the Second National Bank Bldg., Pittsburgh, on or about Mar. 5, as a manufacturer's district representative, and will handle castings and forgings.

**Edmond Ewing** has been appointed by the Alabama Safety Association to organize local chapters of the parent body at the various coal mines and industrial plants throughout the state. Mr. Ewing will be in general charge of this work and his efforts are expected to result in a largely increased membership in the association and a great quickening in interest.

**Thomas Madden**, for five years foreman for the Rochester & Pittsburgh Coal and Iron Co., at Eleanor, Penn., has resigned. Mr. and Mrs. Madden were recently tendered a farewell reception by their friends in Eleanor, and as a mark of the esteem in which they were held Mr. Madden was presented with a gold-mounted pipe and his wife with a gold purse.

**B. W. Wistar** has opened a coal office in the Marine Bank building, Buffalo, under the name of the Wistar Coal Corporation. He was formerly connected with the Goff-Kirkby Coal Co. of Cleveland and opened the office of the Allegheny Coal Co. in Buffalo, leaving it to become the Buffalo representative of the Bader Coal Co. of Boston, which position he retained till now.

**A. H. Ackerman**, formerly vice-president, and general manager of the U. S. Light and Heat Corporation, and C. C. Bradford, formerly sales manager of the same company, announce the formation of the Bradford-Ackerman Corporation, with offices in the Forty-Second Street Building, New York City, to represent manufacturers of electrical apparatus, factory, automobile and railway supplies for domestic and export trade.

**Raymond Dupuy**, president of the Virginian Ry., has sent his resignation to the board of directors of the company, to take effect not later than May 15. Mr. Dupuy will remain in Norfolk, Va., but will retire from active work of any kind. He says his resignation is due only to the fact that he thinks he has been in harness long enough and wishes to take what he considers a well-earned rest. He has been president of the Virginian Ry. for the past two years, having been promoted from the vice-presidency. He came to the Virginian 12 years ago as general manager when the road was built.

## Obituary

**John Jones**, superintendent of the Gatlin Coal Co. at Gatlin, Ky., died recently. He was well known throughout the Jellico district.

**Arthur Burkhardt**, aged 35, a mine foreman of Willock, Penn., died recently from a self-inflicted bullet wound. It is understood that Mr. Burkhardt was despondent over difficulties with his wife.

## Recent Coal & Coke Patents

**Mine Car.** J. W. Clark, Davis, W. Va., 1,211,089, Jan. 2, 1917. Filed May 13, 1916. Serial No. 97340.

**Coal Screen.** P. J. Alwart, Chicago, Ill., 1,207,262, Dec. 5, 1916. Filed June 7, 1916. Serial No. 102,128.

**Coal Car Cover.** T. S. Crowell, Bruins, Ark., 1,209,265, Dec. 19, 1916. Filed May 11, 1916. Serial No. 96,953.

**Grate.** J. W. Reynolds, Mount Jewett, Penn., 1,209,334, Dec. 19, 1916. Filed Sept. 14, 1915. Serial No. 50,677.

**Coal Drill.** P. J. Smith, Kingston, Penn., 1,209,058, Dec. 19, 1916. Filed Jan. 26, 1916. Serial No. 74,459.

**Mine Car Coupling.** D. J. Williams, Herrin, Ill., 1,207,114, Dec. 5, 1916. Filed Feb. 24, 1916. Serial No. 80,209.

**Coal Car Cover.** M. Spratlen, Concordia, Kan., 1,210,566, Jan. 2, 1917. Filed Sept. 11, 1916. Serial No. 119,562.

**Gas Producer.** J. Stewart, Alfreton, Eng., 1,208,689, Dec. 12, 1916. Filed Nov. 18, 1916. Serial No. 593,064.

**Smoke Abating Device.** T. R. Cook, Pittsburgh, Penn., 1,208,098, Dec. 12, 1916. Filed Feb. 12, 1913. Serial No. 747,966.

**Coal Handling Apparatus.** J. M. McClellon, Everett, Mass., 1,208,996, Dec. 19, 1916. Filed Jan. 14, 1915. Serial No. 2240.

**Dumping Car.** C. H. Andrus and C. A. Plank, Harrisburg, Penn., 1,207,122, Dec. 5, 1916. Filed Feb. 1, 1916. Serial No. 75,526.

**Automatic Safety Mining Cage.** G. J. Newell, Goldfield, Nev., 1,207,610, Dec. 5, 1916. Filed Nov. 20, 1915. Serial No. 62,545.

**Method of Carbonizing Fuel.** H. L. Doherty, New York, N. Y., 1,207,723, Dec. 12, 1916. Filed Nov. 15, 1911. Serial No. 660,450.

**Mining and Surface Support.** A. Langfield, Scranton, Penn., 1,207,569, Dec. 5, 1916. Filed Mar. 11, 1916. Serial No. 753,639.

**Classifying Apparatus for Coal.** F. Blanc, St. Etienne, France, 1,208,461, Dec. 12, 1916. Filed Apr. 26, 1916. Serial No. 93,764.

**Coal-Containing Bucket for Coal Barges.** H. Phillips, Viropa, W. Va., 1,207,208, Dec. 5, 1916. Filed Feb. 11, 1916. Serial No. 77,598.

**Apparatus for Separating Fine Coal.** J. M. Draper, Manchester, Eng., 1,210,916, Jan. 2, 1917. Filed Jan. 24, 1916. Serial No. 73,916.

**Ash Ejecting Mechanism.** W. Hartmann, Offenbach-on-the-Main, Ger., 1,209,703, Dec. 26, 1916. Filed Nov. 16, 1914. Serial No. 872,500.

**Miner's Pick.** T. G. Jones, E. G. Cross and D. J. Jones, Rhondda, Wales, 1,210,325, Dec. 26, 1916. Filed Mar. 27, 1916. Serial No. 86,930.

**Manufacture of Briquettes of Coal.** E. Kleinschmidt, Frankfurt-on-Main, Ger., 1,207,130, Dec. 5, 1916. Filed Oct. 3, 1916. Serial No. 123,483.

**Fuel Briquetting Plant.** T. Rigby, assignor to Wetcarbonizing Limited, London, Eng., 1,208,658, Dec. 12, 1916. Filed Feb. 16, 1912. Serial No. 677,923.

**Underfeed Stoker.** W. J. Kenney, assignor to Underfeed Stoker Co., Chicago, Ill., 1,207,768, Dec. 12, 1916. Filed Oct. 10, 1914. Serial No. 866,027.

**Lubricating System for Mining Machine Gearing.** N. Pedulla, Macdonaldton, Penn., 1,268,826, Dec. 19, 1916. Filed July 25, 1916. Serial No. 111,131.

**Automatic Car Stop for Mine Cages.** J. A. Cushman assignor to F. Prox Co., Terre Haute, Ind., 1,207,684, Dec. 5, 1916. Filed Jan. 10, 1916. Serial No. 71,158.

**Coal Agitator for Mechanical Stokers.** R. S. Riley assignor to R. S. Riley Stoker Co., Worcester, Mass., 1,208,011, Dec. 12, 1916. Filed Mar. 4, 1916. Serial No. 82,239.

## Industrial News

**Chicago, Ill.**—The Stroh Steel-Hardening Process Co., of Pittsburgh, Penn., has opened an office at Chicago, Ill., in charge of F. Lloyd Mark, Western sales manager, 728 Monadnock Block.

**Springfield, Ill.**—Governor Louden has appointed temporarily the following mine inspectors in Illinois: James Taylor, Second district; Robert Reavley, of the Fifth district, and Evan D. John for the Twelfth district.

**Plymouth, W. Va.**—The Plymouth Coal Mining Co. recently had a small fire in its mine, causing it to be closed down for two days. The fire was the result of too heavy a shot, but was extinguished in a short time.

**Connellsville, Penn.**—D. B. Zimmerman, of Somerset, has purchased 236 acres of coal from G. A. Wadsworth for 11,310. The tract lies in Donegal Township of Westmoreland County and Salt Lick Township of Fayette County.

**Owensboro, Ky.**—Following the lead of Frankfort, Ky., the city administration here proposes to embark in the retail coal business and will supply coal in limited quantities to citizens, showing preference to those who are in greatest need.

**Louisville, Ky.**—Plans and specifications for three revenue cutters, 160 ft. in length and 30-ft. beam at the water line, to be placed in service on the Ohio and Mississippi rivers, have been received in Louisville. These boats will be assigned to render assistance to shipping on the two rivers.

**Johnstown, Penn.**—A deal was recently closed whereby Albert E. Raymond and Charles F. Hoy, of Somerset, sold to Joseph Barnes, of Pittsburgh, a tract of 500 acres of coal land in Lincoln Township of Somerset County, at an average price of \$250 per acre, the total consideration being \$125,000.

**Springfield, Ill.**—Records in the United States Court here show that John Tucker, of Springfield, who was a passenger on the "Laconia," received his naturalization papers Sept. 21, 1914. He was born in England. According to his wife here he was returning to England to follow his occupation of miner.

**Connellsville, Penn.**—The Supreme Court of Pennsylvania recently decided that although a coal operator is under no legal obligation to warn an employee against obvious dangers, nevertheless an inexperienced man put at work operating a coal-cutting machine is entitled to warning against those dangers incident to its operation which are not plainly apparent.

**Columbus, Ohio**—It is announced that the Lewis-McKnight Coal Co., just incorporated with a capital of \$10,000, at Charleston, W. Va., will have offices in Columbus, Ohio, and will control properties in both states. The head of the enterprise, Lyman P. Lewis, has been connected with the Kanawha & Michigan R.R. for a number of years, with headquarters at Charleston.

**Uniontown, Penn.**—The sale of the Thompson interest in 12,000 acres of Greene County coal recently purchased by the H. C. Frick Coke Co. has been confirmed by an order of the court. This order refuses the motion to vacate the appointment of the receivers, and directs that the purchaser shall satisfy all of the liens against the property and then pay the balance into the hands of the receivers.

**Philadelphia, Penn.**—Serious coal conditions face the Pennsylvania railroad east of Pittsburgh and Erie. Coal supply for the present year will cost from \$6,000,000 to \$8,000,000 more than last year. Officials cannot at this time predict a future price. In order to cut down the increased cost of fuel, orders have been issued to all departments, urging economy in the use of soft coal.

**Birmingham, Ala.**—C. S. Bissell and associates of Birmingham have acquired the property of the Miller Coal Co., near Cordova, Walker County, and have incorporated the Cordova Fuel Co. as the operating organization. This property consists of about 80 acres of Big Seam coal and has a drift opening on the Frisco R.R. Considerable improvements are contemplated to bring about an increased production.

**Columbus, Ohio**—The Buckeye Coal and Railway Co., of Columbus, has authorized the building of a railroad 5 miles long in order to better develop coal lands in the Hocking Valley field. The railroad will connect with the Kanawha & Michigan at Bailly Run Junction and will extend up two branches of Bailly Run. By means of the road the mines of the Buckeye will have an outlet on both the Hocking Valley and the Kanawha & Michigan Railroads.

**Ridgway, Penn.**—The big demand for coal has so increased the activity in the line of working the mines and opening new ones that it is

predicted that the counties of Elk, Jefferson and Cameron will in 1917 produce twice the amount that they did in 1916. Jefferson County produced 2,081,596 tons last year, Elk County, 972,510 tons and Cameron County only 24,232 tons. The activity in Cameron County is now great, especially in the opening of new mines.

**Bangor, Me.**—The fuel situation of the Bangor & Aroostook R.R. became extremely serious recently, when the railroad was reduced to such straights that a curtailment of the passenger service was contemplated by President Percy R. Todd. Weather conditions and the inability of the carrying railroads to move coal are to a great extent responsible, and the efforts of two of the company's representatives sent to Philadelphia for the purpose of hastening cargoes forward have been of no avail.

**Washington, D. C.**—The Interstate Commerce Commission has suspended, until June 25 next, a tariff proposed by the Chicago, Burlington & Quincy R.R. proposing to cancel the joint through rates on coal from mines located on that road in Illinois to Muscatine, Iowa, applicable via Burlington, Iowa, and the Muscatine, Burlington & Southern R.R., leaving no through rates in effect via this route. The commission will conduct an investigation into the reasonableness of the proposed cancellation.

**Alton, Ill.**—Hubbard & Co., manufacturer of mining tools at Pittsburgh, has purchased the Beall Brothers shovel factory at Alton, and the mining tool factory of Beall Brothers in East Alton, as well as the distributing warehouse in Marion, Illinois. The purchase price is reported to be over \$500,000.

The new owners will more than double the capacity of both of these plants and are considering the building of a steel rollingmill, the product to be used in the manufacture of shovels.

**Boston, Mass.**—A demand that the Government be supplied with reports of the movement of both empty and loaded coal cars in New England during the rest of the cold weather was presented by United States District Attorney George W. Anderson to the representatives of the freight departments of the New York, New Haven & Hartford, Boston & Albany and Boston & Maine railroads at a conference with them recently. This demand was made in connection with District Attorney Anderson's investigation of the high cost of living.

**St. Louis, Mo.**—Chances of workmen's compensation legislation at the present session of the Missouri Legislature were practically destroyed when the House refused recently, by the vote of 55 to 62, to order to engrossment the bill drawn by Representative Alroy S. Phillips of St. Louis. The bill was endorsed by many organizations and had been amended in many respects after being introduced. Another bill for the same purpose is pending in the Senate, but it is not likely to receive as many votes as did the House bill.

**Columbus, Ohio**—Word was received from railroads entering Michigan from Ohio territory, a short time ago, to the effect that all of the embargoes, which held coal shipments out of Detroit, have been lifted. This includes the Pere Marquette, the Ann Arbor, the New York Central lines, the Wabash, the Michigan Central and other roads. This is expected to help the Detroit situation to a certain extent at least, and will be quite a boon to Ohio operators and shippers, who have had hundreds of cars of coal tied up in the yards at Toledo and other junction points.

**Philadelphia, Penn.**—There has been a noticeable increase of late in the number of ocean charters recorded for coal shipments to South America and points in the Caribbean Sea. In the recent past there has been an unusually large number of clearances for both of the above places. This is no doubt due to the war zone declared by the German government which has made ship owners somewhat timorous of accepting transatlantic charters under present conditions. Most of the charters have been taken at the high rates which have been prevailing for a year or more, but even at that the increased shipments to both South America and the islands of the Caribbean Sea are particularly opportune, as the coal supply there has been running extremely short for some months past.

**Toronto, Canada**—The recently established Council for Scientific and Industrial Research is investigating the fuel-supply question, which is one of growing importance, especially in the Provinces of Saskatchewan and Manitoba. The former province has large deposits of lignite, but as this coal possesses relatively low heating power and will not stand shipment and storage it is of comparatively little value. The council believes, as the result of former investigations by the Mines Department and the Commission of Conservation that there may be produced from this lignite two grades of high-class briquetted fuel, one having the characteristics of anthracite and the other resembling soft coal, and that valuable byproducts will also be secured. Provided further experiments prove satisfactory the council will advise the construction of an experimental plant to turn out briquettes on a commercial scale.



# Market Department

## GENERAL REVIEW

**Anthracite** demand less urgent, but supplies are still critically short. Abnormal prices on bituminous forcing some industrial plants to suspend operations. Heavy congestion of traffic counteracts efforts of buyers to break the market. Increasing demand and decreasing supplies in the Middle West.

**Anthracite**—While much of the most urgent demand has been relieved by the intermittent periods of mild weather, the trade is still very hard pressed for supplies. Dealers are showing a disposition to buy cautiously in order to avoid carrying over any high-priced stock into the summer, especially those at more remote points where deliveries are very slow as a result of the heavy rail congestion. But in spite of this restriction, supplies at distributing centers are far shorter than is generally known or appreciated, and a severe cold snap of any proportions would create a critical situation. Conditions are very erratic and subject to violent fluctuations, but at the moment premium prices are ruling as high as at any time this season. Retail men regard the past season as one of the most trying in their experience and withal not a very profitable one either. Careful observers are of the opinion that a very active summer season is ahead with none of the customary dull months.

**Bituminous**—In spite of the advancing season and milder weather, the tremendous railroad congestion at the Atlantic seaboard has made it almost impossible to get sufficient coal forward to keep industrial plants going, while prices on any free tonnages available at distributing centers have touched new high levels. An unsavory incident of the situation is the fact that the railroads are occasionally forcing some mines to load coal at prices very substantially under the ruling market by threatening to withhold cars. Another development occasioned by the ruling high spot prices has been the suspension at some manufacturing plants pending a return to more normal levels. Disaffection in labor circles, due to attractive offers in other lines, together with the very meager operating time at mines occasioned by short car supply, is another cause for much anxiety. Export business is greatly demoralized, but bunker demands are very heavy, due to most vessels coaling for the round trip. Evidence of the increasing tension in our international relations is seen in the strict censorship being observed concerning shipping matters.

**Ohio Valley**—There is considerable manoeuvring in the Pittsburgh district to break prices, the Steel Corporation, for instance, having withdrawn from the spot market; with the very poor car supply at the opening of the week, however, these efforts did not meet with much success. The advancing season is having an effect and limited amounts of coal are beginning to accumulate at a few distributing centers, though buyers still have very little choice as to quality or grade. The danger of a serious famine in Canada, which threatened for several weeks, is now considered as over. The situation on new contracts is very mixed as would be expected in an abnormal market, such as now prevails. Some buyers are pressing hard for contracts, while a great many others are consistently refusing to meet the sellers' views as to prices; this is particularly the case on 12 months' business, some buyers expressing a willingness to meet these prices on three or six months' contracts.

**Middle West**—The acute railroad congestion continues to dominate all other features in the Western trade. As a result of daily conferences of railroad officials and shipping interests, and the adoption of drastic action giving effect to a complete right of way over all other freight, conditions have been improved temporarily in isolated instances, but the general situation continues as grave as ever. As a result of these conditions, still more manufacturing plants have been compelled to suspend operations, while another spell of severe weather would very soon cut off supplies entirely to a great many more consumers. A compensating feature of the situation is the fact that dealers are showing a disposition to buy cautiously in order to avoid carrying over any high-priced stocks. But in spite of this, the general situation is marked by an increasing demand and decreasing supplies. Jobbers are complaining that the Eastern roads are confiscating large tonnages of coal from that section.

**A Year Ago**—Anthracite slowing down, especially on domestic grades. Negotiations at the wage conferences controlling factor in all markets. Bituminous spotty, and no definite developments on contracts. Exports increasing. Middle Western markets are less active.

## Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

Boston	Year Ago	Mar. 3	Feb. 24	Feb. 17	Feb. 10	Feb. 3
Clearfields.....	*\$1.45@2.00	\$5.60@6.50	\$5.15@6.00	\$4.85@5.50	\$4.60@5.15	\$4.50@4.25
Cambrias and Somerset.	*1.60@2.15	5.90@7.00	5.50@6.25	5.00@5.75	4.85@5.50	4.90@5.50
Pocah. and New River <sup>1</sup>	2.80@2.90	7.00@7.25	7.00@7.25	6.75@7.00	6.50@6.75	6.50@6.75
Philadelphia						
Georges Creek (Big Vein)	*2.50@2.75	6.25@6.50	5.75@6.00	5.50@5.75	5.75@6.00	5.75@6.00
W. Va. Freeport.....	*1.45@1.55	5.75@6.00	4.75@5.00	4.00@4.50	5.00@5.15	5.00@5.15
Fairmont Gas mine-run.	*1.50@1.60	6.25@6.50	5.25@5.50	5.00@5.25	5.25@5.50	5.25@5.50
Pittsburgh (steam coal) <sup>2</sup>						
Mine-run.....	1.25@1.30	5.25@5.50	5.25@5.50	5.25@5.50	4.95@5.05	4.70@4.80
3-in.....	1.35@1.40	5.25@5.50	5.25@5.50	5.25@5.50	4.95@5.05	4.70@4.80
Slack.....	1.15@1.20	5.00@5.25	5.00@5.25	5.00@5.25	4.70@4.80	4.40@4.60
Chicago (Williamson and Franklin Co.) <sup>3</sup>						
Lump.....	1.60@1.75	3.25@3.50	3.75@4.00	3.50@3.75	3.75@4.00	3.75@4.00
Mine-run.....	†1.15@1.25	3.00@3.25	3.50@3.75	3.00@3.50	3.00@3.25	3.25@3.50
Screenings.....	*.90@1.00	2.75@3.00	3.25@3.50	3.00@3.25	3.00@3.25	3.25@3.50

Gross average<sup>3</sup>.....\*\$1.56@1.74 \$5.10@5.48 \$4.95@5.29 \$4.67@5.04 \$4.70@4.95 \$4.66@4.86  
<sup>1</sup> F.o.b. Norfolk and Newport News. <sup>2</sup> Per net ton. <sup>3</sup> The highest average price made last year was \$4.80@5.33 made on N.v. 25.

\* Price lower than the week before. † Price higher than the previous week.

## BUSINESS OPINIONS

**Iron Age**—Pig iron continues to hold the spotlight. The spurt which the car congestion gave to prompt delivery buying two and three weeks ago was accentuated in the last week by still higher and more widely divergent prices. Dependent largely on the present unusual situation, prices are sooner or later expected to come more nearly in line with contract levels.

**Dun**—Partial relief from the traffic congestion has bettered the position of business, though progress in many directions continues hindered by the delays in transportation. Inability to promptly secure urgently needed supplies of raw materials still affects most industries adversely and not a little machinery is idle, while distribution of the necessities is impeded and the strength of prices intensified. Commercial failures this week in the United States are 267, against 276 last week, 296 the preceding week and 407 the corresponding week last year. Obstacles in overseas shipping also restrict export movements, and the doubts about foreign affairs make for general caution in entering upon engagements for the future. Unlike the recent experience, demands are mainly confined to immediate requirements, and speculative tendencies are discouraged; yet Federal contracts accentuate the pressure on producing forces and consumption of staple products is sustained in large volume, notwithstanding the high prices. Many commodities, in spite of the rapidity and extent of the previous upturn, have risen further to an unprecedented level, and this week's list of over 300 wholesale quotations discloses 66 advances and 19 recessions.

**American Wool and Cotton Reporter**—The wool market for the week under review has been quiet but strong and the feeling that prices will reach \$2 per pound is fully as firm. The fine stocks as they become exhausted are replaced by the medium grades of wool. It is reported that 80 per cent. of the Utah April clip has been contracted for on the sheep's back at prices ranging from 30 to 38 cents. This clip approximates 15 to 16 million pounds. The volume of sales has been somewhat less than the previous week, owing partly to the holiday and partly to the fact that the supply is becoming smaller.

**Marshall Field & Co.**—Current wholesale distribution of dry goods shows a good increase over the corresponding period of a year ago. Road sales for spring and immediate shipments are running in advance of the sales last year, while future business is noticeably ahead of that of the same period 1916. Customers have visited the market in about equal numbers. Collections for the week have been normal.

**Bradstreet**—Trade, reflecting heavy purchasing power both on domestic and foreign account, is large—in excess of a year ago, in fact—at nearly all markets. This, too, despite harassing disadvantages provided by the worst railway congestion in history, record high prices of commodities, the unsettled outlook of our foreign relations, and the threat against our foreign trade, represented by the continued sinking alike of neutral and allied shipping. Railway embargoes retard or curtail industry, high prices for foodstuffs superinduce social unrest, and the clouded aspect of our foreign affairs directly or indirectly holds up financial enterprises and,

mingled with the factor of high prices, tends to render buyers cautious as to making further commitments for distant delivery.

**Dry Goods Economist**—With no new and acute developments in our relations with Germany the dry goods market at this writing may be said to have marked time since the beginning of the week. Though among the larger operators there has been a greater tendency to conservatism, retailers generally have shown little hesitancy in placing orders. Wholesale distributing houses in various centers, therefore, report active demand. Many complaints are heard of delay in deliveries. This is due partly to insufficient output and partly to the railroad freight congestion.

## Contract Prices

**Pittsburgh**—Consumers are refusing to meet the sellers' views as to prices, though some of them would undoubtedly consider these figures on three or possibly even six months' business. The market is stagnant with sellers holding at the previously announced price of \$3 to \$3.25 for steam mine-run.

**Buffalo**—There is a general disposition among selling interests to avoid future commitments and they are looking forward to big profits when the existing contracts expire.

**Louisville**—There is little business being negotiated, and prices on new contracts vary from \$2.25 to \$3 for mine-run coal as compared with \$2.50, announced in our issue of Feb. 10.

**Columbus**—The unsettled condition of the market is delaying contracting, but we note one large 12-months' contract for No. 8 slack on the basis of \$2.50. On short-term contracts to run through the summer, operators are asking \$3.25 to \$3.50 for mine-run coal which compares with the price of \$2.50, announced in our issue of Jan. 27, as the tentative basis for 12 months' contract. Railroads are refusing to meet the \$3 figure now quoted.

**Chicago**—Steam plants are being required to pay 75 to 100% increase over old contract prices, and railroads are being asked 50 to 75c. per ton more. Some short-term contracts for shipments to the Northwest have been concluded at very high prices. The coal interests are generally backward about closing, while large industrial consumers and railroads are eager to cover.

**St. Louis**—Contracts aggregating 100,000 tons of Mt. Olive, 1 1/4-in. screenings to run for about one year have been concluded at \$1.25 per ton at the mines, and another contract involving 30 cars per week at the same figure and under the same conditions. A contract on Standard No. 2 nut, involving four to five cars per week for delivery between Feb. 1, of this year and Apr. 1, next year, was concluded at \$1.60 at the mines. Contracts for a large tonnage of Standard mine-run for delivery during the next 12 months, are being negotiated at \$1.25, though with nothing definite closed as yet. It is conservatively estimated that Williamson and Franklin Counties' screenings contracts will be covered in limited quantities at \$1.75 to \$1.85, and mine-run at \$2.

## Atlantic Seaboard

### BOSTON

No improvement in supply at Hampton Roads. Shippers hard pressed to get ships cleared. Movement to Tidewater very irregular. Almost no spot sales; prices very firm. Pennsylvania grades reach new high levels. Anthracite deliveries much hampered by weather conditions.

**Bituminous**—Very little Pocahontas and New River is moving via Hampton Roads except on contract or on old purchases. All the agencies are extremely anxious about receipts from the mines. Conditions in the region continue unfavorable to much more than a minimum output and car movement is as slow as ever. Pier dumping also is slow on account of frozen coal. Only by close figuring are ships cleared in less than four to five days. Meanwhile, practically no commitments are being made on futures. Enough small lots to dispatch ships are heard from, however, to establish the firm market. If March should prove another heaving coal-burning month, stocks in this territory would be much depleted.

The anxiety will be general until shipments catch up with the volume consumed. On cars Boston spot coal has run up to \$14.50, and \$15 has actually been quoted on lighter-loads for harbor delivery. The larger retail dealers are on the ragged edge for supplies in most of the cities, particularly those on Tidewater. All sorts of expedients are resorted to in order to supply consumers from day to day. Eastern Massachusetts is being scoured for anthracite screenings to help out the supply of bituminous for Boston hotels and business blocks. In some of the mill centers coal is actually being carted from one plant to another in the effort to keep all going until fresh supplies are received. A growing shortage of cars even for short hauls from Tidewater inland is causing a lot of worry. This is especially true in Maine where boats are on demurrage at Portland waiting for cars. The Bangor & Aroostook Railroad has had to cancel several of its trains on account of fuel shortage.

The weather has been continuously cold. One textile mill that ordinarily uses 835 tons a month used 410 tons in a single week recently. Greenhouse men say there has not been a night since November that fires could be banked.

Spot prices f.o.b. the Virginia piers are \$7 strong; but only a very few small agencies who are without regular sales connections are in position to furnish any coal. On contract business there is no news. Relatively not very much tonnage remains to be placed among interests who control transportation. The railroads have shown some interest the past week but it is probable that new business will be placed in the same channels through which present supplies are drawn.

A few shippers apparently are inclined to take on more season business, judging from advances made, but this attitude is confined largely to those who have no regular arrangements for export trade. There is an opinion among some of the agencies that this is the kind of market to sell a proportion of one's output and reserve the rest.

Georges Creek is still in extremely light supply. No sales of any kind are being made. Consumers who bought this grade last year are keenly interested to learn what attitude the shippers are to take toward unfulfilled obligations for the contract season expiring Mar. 31.

Shipments of Pennsylvania grades are still curtailed by shortage of labor and poor car-supply. In several cases the railroads have been obliged to withhold cars except for locomotive fuel, so urgent have been the needs of the railroads themselves. Movement to New England has been slow. Prices have been correspondingly high for coal actually en route, as high as \$7 f.o.b. mines having been paid for small lots and even higher prices likely to be paid. Contract demand is also very strong, but few quotations are reported.

The spot prices of a week ago have been advanced from day to day. Railroad congestion has made loading at Tidewater very uncertain. Embargoes have been intermittent and it continues difficult to arrange for cargo shipment.

Ice conditions in the Delaware are slowly improving. It will be a fortnight, however, before tugs and steamers resume regular trips. Several barges were so damaged by ice that they had to be returned to Philadelphia and their cargoes taken out.

One of the New England railroads recently got a very slender response to its general invitation to submit bids. Operators are much inclined to keep as much of their output "free" as possible.

Bituminous at wholesale is quoted about as follows, f.o.b. load-ports at points designated, per gross ton:

	Clearfields	Camb. and Somerset
Philadelphia.....	\$6.85@7.75	\$7.15@8.00
New York.....	7.00@8.00	7.40@8.25
F.o.b. mines.....	5.60@6.50	5.90@7.00
Alongside Boston (water coal).....	10.25@10.50	10.50@11.00

Pocahontas and New River are quoted at \$7@7.25 f.o.b. Norfolk and Newport News, Va., for spot coal, and \$13@14.50 on cars Boston and Providence for inland delivery. One lighter-load of Clearfield was quoted at \$15 alongside.

**Anthracite**—This week was one of very light receipts. Tugs have been so much occupied moving barges through the ice in the Delaware that Philadelphia shipments have been few and far between. Boston retailers have been in far worse shape this past fortnight than the public has realized. Egg is very scarce indeed, and practically no broken is to be had. Stove and chestnut are doled out only in small quantities.

All-rail deliveries are also slower than they were. Speculative coal is still to be had in all sizes and the demand continues strong. The embargo against consignments via the New Haven railroad has now been raised.

There is some local interest in circular prices for next season. It is intimated in some quarters that on the steam sizes at least there will be an announcement soon after Mar. 1. The operators have noted the scaling up in prices of bituminous and are naturally disposed to get as high prices as possible for the different sizes of buckwheat.

### NEW YORK

**Anthracite easier, but supplies short.** Loading at the piers slow. Anthracite steam sizes scarce. Car supply in bituminous regions poor and producers have difficulty in meeting contracts. Railroads heavy buyers.

**Anthracite**—Conditions are a trifle easier. Although dealers admit a shortage of stocks they refuse to buy at the existing quotations for independent coal unless in absolute want. This has resolved itself into a waiting market but each cold spell sends the dealers after coal.

New York Tidewater supplies are about as low as they ever have been, except during strike periods. Congestion along the railroads has not improved and Tidewater shippers complain of the delay in handling vessels. Because of this deliveries are slow to New England and along the Sound.

All sizes are about equally scarce, although some wholesale dealers are quoting chestnut a trifle easier than either egg or stove. There was a small lot of broken offered early this week which was quickly absorbed. One consumer took broken coal on a chestnut contract. Pea coal is hard to get and quotations are nearly even with the larger sizes.

The steam sizes continue scarce and many shippers have none to offer here, while mine orders are taken subject to delay. Offers of high prices for loaded boats with a guarantee of quick delivery are not infrequent. With buckwheat No. 1 almost out of the market consumers of this grade are taking any of the larger coals they can get. Rice is said to be scarcer than either buckwheat No. 1 or barley, and shippers fortunate enough to have some free independent boiler are getting good prices.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken.....	\$4.95	
Egg.....	5.45	\$8.00@8.25
Stove.....	5.70	8.00@8.25
Nut.....	5.75	8.00@8.25
Pea.....	4.00	7.00@7.50
Buck.....	2.75	6.75@7.25
Rice.....	2.20	5.00@5.50
Barley.....	1.95	4.25@4.50
Boiler.....	2.20	

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

**Bituminous**—Producers received an average of from 25 to 30% of their car requirements during the past month, while the lowest average heretofore has been from 40 to 60%. Operators are optimistic, however, and look for a considerable reaction in prices and market conditions if cars should be plentiful for a few days.

The range of quotations at the New York Tidewater does not show any material change in conditions, but stocks are better; there is also a stronger spot market and more deliveries are being made. Early this week the quotations ranged as high as \$8 but some of the cheaper coals were quoted as low as \$7.25. At the same time offers were made of loaded boats at \$7.75 alongside in order to save extra charges.

Even with a better spot market there was a scarcity of coal and a shipper with a 1000-ton order for quick delivery would have had difficulty in getting that tonnage together.

The railroads are in the market for heavy tonnages. An offer of around \$2.25 at the mines for an output of between 400 and 500 tons per day was reported. Another offer for a large tonnage of Indiana County coal at about \$2.75 at the mines was also made. For general contracts the quotations remain from \$2.75 to \$3.50 at the mines.

The local loading piers are free of embargoes, except at Port Reading where there is a general order in effect excepting against a few individual shippers. Railroad deliveries are slow and with the poor car supply producers are behind on their contracts. Water deliveries from this harbor were poor.

Very few contracts are being made. Bunker demand continues good but there is delay in loading.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	Port Reading	South Amboy	Mine Price
George Crk.			
Big Vein.....	\$8.00@8.25	\$8.00@8.25	\$6.25@6.50
Tyson.....	7.75@8.00	7.75@8.00	6.00@6.25
Clearfield.....	7.75@8.00	7.75@8.00	6.25@6.50
South Frk.....	7.75@8.00	7.75@8.00	6.25@6.50
Nanty Glo.....	7.75@8.00	7.75@8.00	6.25@6.50
Son'r. Co.....	7.75@8.00	7.75@8.00	5.75@6.00
Que'ho'ing.....	7.75@8.00	7.75@8.00	6.00@6.25
W. V. Fa'r'm't			
Th'r'qua.....	7.50@7.75	7.50@7.75	5.75@6.00
Mine-run.....	7.50@7.75	7.50@7.75	5.75@6.00
West. Md.....	7.40@7.50	7.40@7.50	5.25@5.50

### PHILADELPHIA

**Anthracite yards continue empty and only one company is making good shipments.** Demand for all sizes extremely active. Bituminous prices advance rapidly. Railroad congestion halts shipments. Car shortage acute and mines are taking railroad orders to get cars.

**Anthracite**—Receipts show no improvement, but they could easily be worse so there is at least some satisfaction. There is no lessening in the demand for coal but much of the panicky feeling of the previous weeks has been dissipated.

However, it is only the milder weather conditions that has once more saved the situation. Dealers' yards remain practically empty and no one has a stock of all sizes.

The very liberal shipments here of the biggest company is the only thing that has averted a real panic. The other companies are falling behind at an alarming rate and their representatives are sorely pressed for explanations as to why they have neglected trade here in favor of other markets. This naturally gives rise to the suspicion that the coal is being sold at higher prices than can be obtained here.

The retail men are undoubtedly passing through one of the most trying seasons in their history, in addition to which their efforts will be rewarded with only meager profits. The present week was another one of turmoil, with its daily wrangle with customers and shippers.

Wholesale premium prices have been as high as ever, but there is a tendency, as the season advances further, to be wary of shipping much coal at top prices to distant points. The deliveries of the railroads have been so slow that some shippers fear that high-priced coal shipped now will not reach destination for from four to six weeks and by that time the market may be off and the coal refused on one pretext or another.

In the Hazleton region there were 8000 men idle on a single day this week on account of having no cars to load. All over the region the men are becoming extremely restive, as between the enforced reduced working days and the rapidly mounting cost of living there are many mutterings for increased wages, which has resulted in action being taken by some of the locals in the form of recommendations.

All sizes are in such active demand that dealers are still asking for any kind of coal that can be had. This demand will necessarily grow smaller as the season advances, but as stocks are at such a low ebb it will be some time before the shippers are relieved.

Chestnut is the most plentiful but no one has a surplus. Egg, stove and pea are as active as ever, especially the latter. Indications point to a very busy year, with no slack months for the coal man.

It is expected almost any day now that the big anthracite shippers will announce contract rates on their steam sizes. While it has been thought for several weeks past, following the announcement of the new market price of buckwheat, that the contract figure would be \$2.50 for that coal, it is rumored that the price might be still closer to \$3. Much depends on the development of the bituminous situation, which at this time is quite acute.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line Tide	Line Tide
Broken.....	\$4.25 \$5.40	Buck..... \$2.50 \$3.40
Egg.....	4.15 5.25	Rice..... 2.10 3.00
Stove.....	4.10 5.6	Boiler..... 1.95 3.15
Nut.....	4.50 5.55	Barley..... 1.85 2.05
Pea.....	2.80 3.70	

**Bituminous**—The rising price tendency which began two weeks ago gained additional momentum this week with increases ranging from 50c. up to \$1.25, and averaging about \$1. Even some of the poorest grades were quoted at top figures. Owing to the badly congested condition of the railroads, coal became particularly scarce and even higher prices than we record were received in isolated instances. Spot coal has been particularly hard to procure, while shippers on contract have been hard pressed to meet their obligations and prevent plants from shutting down. The seriousness of the situation has been further complicated by the heavy



tonnages which the railroads have confiscated for engine fuel.

The lack of empty cars also continues a serious factor, and a number of shippers have been known to accept orders from the railroad companies at reduced rates in order to secure a sufficient number of cars to keep their mines going. We know of one particular case where the mine owners have taken a fuel order of this kind at less than they can actually produce the coal; the feeling among their men had become such that the company deemed this necessary in order to assure the men of earning a living; they have in addition arranged with the stores to make sales at actual cost for the time being.

With the sudden increase in market prices, few new tenders of contracts have been made and those were closed at once or withdrawn entirely. Of course under these conditions the consumers began to show greater interest in contracts, but shippers are now regretting that they have even obligated themselves for the tonnage already closed.

It is almost certain that coal prices will advance further, as it will be some time before the shortage of fuel in this market can be made up, and for that reason the prices which we quote at this time are liable to advance over night.

Georges Creek Big Vein.....	\$6.25@6.50
South Fork Miller Vein.....	6.25@6.50
Clearfield (ordinary).....	6.00@6.25
Somerset (ordinary).....	6.00@6.25
West Va. Freeport.....	5.75@6.00
Fairmont gas lump.....	6.25@6.50
Fairmont gas, mine-run.....	6.25@6.50
Fairmont gas, slack.....	6.00@6.25
Fairmont lump, ordinary.....	6.00@6.25
Fairmont mine-run.....	6.00@6.25
Fairmont slack.....	6.00@6.25

#### BALTIMORE

Poor car supply in mining regions and lack of fuel here sends soft coal to unprecedented levels. Hard coal very scarce. Exports at a standstill and all official news of shipping withdrawn.

**Bituminous**—The situation as regards supplies is the most serious ever faced by the coal trade here. Lack of soft coal in Baltimore and vicinity has resulted in such high prices that some small plants have shut down for a time, while others willing to pay practically anything for coal, have at times been in desperate straits with but a few hours' supply on hand. Coal men here have been forced to bend every effort to meet the situation.

Prices have kept moving upward, and sales of coal on a mine basis as high as \$7.50 have been recorded. An average, where any coal is to be had in the open market, has been maintained about as follows: Georges Creek Tyson, \$7.25; Quemaoning, \$7.00; South Fork, \$6.50 to \$7.00; Somerset, \$6.50; Clearfield, \$6.50; Freeport, \$6; Fairmont gas, three-quarter, \$6.50; same, run-of-mine and slack, \$6.00 to \$6.50.

Labor supply is still inadequate, even at a time when car supply drops to almost nothing. Because the mines are running so irregularly, due to the car shortage, working conditions have been unsteady and still more miners have left for other industries. The Georges Creek operators have just given an inducement of increased pay and shorter hours to hold their workers. The ice in the Chesapeake Bay is gradually disappearing and renewal of coal barge shipping will be resumed as soon as coal is available at tide.

**Anthracite**—The hard coal men are having a struggle. Receipts are far below immediate requirements and many dealers have been paying premiums up to 50c. a ton to get coal through for some of their most urgent customers. With the retail schedule maintained steady here throughout this trying winter, the margins of profit for most of the dealers here has been small.

**Exports**—There was but one foreign loading here again last week and the tonnage and vessel name is refused by the Custom House. An order from Washington has suspended the announcement of vessels arriving or clearing.

#### HAMPTON ROADS

Exports hampered by scarcity of vessels. Coastwise movement heavy. Bunker requirements normal. Car supply still unsatisfactory. High volatile tonnage coastwise increasing. Government withholding information regarding vessels in foreign trade. Prices without change.

Shippers are complaining of their inability to secure vessels for the offshore trade, claiming that orders are often lost on this account. There is no doubt a shortage of vessels for prompt loading, but it is hoped this situation will improve shortly. Sailing vessels, which were so plentiful a few months ago, are now difficult to secure. Coastwise tonnage is moving in larger volume than for some time past and, with the high coastwise rates prevailing, owners are not anxious to put their vessels in the foreign trade. Steamers owned by coal shippers are operating regularly in the coastwise trade, supplemented by schooners and barges and all of these vessels seem to be moving. A short time ago there were a number of ocean-going barges lying in Hampton Roads seeking a charter, but these vessels now are all busy and it is

an unusual sight to see an unchartered vessel in port.

Bunker deliveries are about normal and there has been no decrease in this class of business on account of the higher price this year. In some cases steamers require an abnormal amount of bunker coal and many shippers are charging the market price for any tonnage taken over normal requirements.

Car supply is still far from normal and causes serious delays to vessels in some instances. With the opening of navigation on the Lakes now in sight prospects for full car supply seem rather remote and this is one of the reasons shippers are not seeking contracts. As indicated some months ago the scarcity of the smokeless grades at Tidewater has brought a considerable tonnage of high volatile coal to this market, most of which moves coastwise, with an occasional cargo for export. With prices and supplies as at present this coal will continue to be shipped in increasing quantities via Hampton Roads.

The large steamer "Franklin" of the Consolidation Coal Co., which has been engaged in the trade from Baltimore to Alexandria, Egypt, is now back in the coastwise trade between Hampton Roads and Boston. There is an active trade at present in small schooners carrying coal to Bermuda; rates for this voyage have taken a big jump recently. The Government no longer gives out any information regarding the movement of vessels in the foreign trade.

Prices show no change since last week and are about as follows: Pocahontas and New River run-of-mine for coastwise and export \$7 per gross ton; bunker coal \$7.50 per gross ton plus 15c. trimming, local delivery on track \$6.50 per net ton. Anthracite \$9 per net ton delivered.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	Feb. 3	Feb. 10	Feb. 17	Feb. 24
Nor. & West.....	84,162	106,980	114,832	127,765
Ches. & Ohio.....	103,279	44,328	130,752	125,089
Virginian.....	77,154	58,083	77,158	69,014
Total.....	264,595	209,391	322,742	321,868

#### PANAMA CANAL

Fuel movement through the canal for the two weeks ended Feb. 9 was as follows:

Vessel	From	To	Tons
Proteus	Norfolk	Cavite	110,664
Elder Branch	Newport News	Antofagasta	6,187
Ferrona	Baltimore	Iquique	6,533
Angamos	Newport News	Valpariso	3,558
Twickenham	Newport News	Tiburón	6,716

<sup>1</sup> Coal and general cargo.

### Ocean Shipping

#### OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

#### BALTIMORE

Name	Destination	Tons	Rate
Sahara	Valparaiso	12,664	
Kersfjord	Havana		

#### VIRGINIA

Nordhavet <sup>2</sup>	Rio Janeiro or Santos	7,500	
L. M. Baxter	San Juan	1,153	
Myrtle Leade	Para	336	
Gantock <sup>3</sup>	Montevideo	1,556	
Protector	Montevideo <sup>4</sup>		

#### NORFOLK

Peter H. Crowell	Pernambuco		
Chas. D. Loveland	Para	653	\$15.00
Horatio G. Foss	Demerara		12.00
D. H. Rivers	Point-a-Pitre		
Jacksonville	Porto Rico		
Geo. H. Ames	Bermuda		

<sup>1</sup> Coke. <sup>2</sup> March. <sup>3</sup> Mar.-Apr. <sup>4</sup> Option Buenos Aires.

#### COASTWISE FREIGHTS

Four dollars was offered this week for a steamer from Hampton Roads to Boston, but was declined. A few days before, a certain amount of barge tonnage was closed for a single trip at \$3.75. Bottoms are extremely scarce and shipments are therefore confined to the few interests who control transportation.

One or two steamers that were in the offshore trade have been used coastwise for a trip or two, but have now been closed for trips to South America.

Rates on barges out of New York for Long Island Sound ports are \$1.25@1.50. \$1.90 was quoted to Boston during the week.

The management of the Cape Cod Canal have notified patrons that all vessels requiring towage through the canal must make their own independent provision for such service hereafter. A further announcement is made that no vessel of the "whaleback" or Great Lakes type will be permitted to pass through the canal, this presumably because two vessels of that type within a year have caused serious damage to the canal.

#### OCEAN FREIGHTS

Freight conditions are practically the same as a week ago. There are a few prompt boats asking for coals to the east coast of South America and to the West Indies, which boats can be secured on favorable terms, but unfortunately, very few shippers can avail themselves of this opportunity owing to the scarcity of prompt coal. We also have a number of steamers for later loading that can be secured on favorable terms. No charters worthy of comment were reported during the past week.

We would quote freight rates on coal by steamer as follows:

	Feb. 19	Feb. 26
<b>Europe</b>		
West Coast Italy.....	\$56.80@62.40	\$56.40@62.40
Marseilles.....	54.00@58.80	54.00@58.80
Barcelona <sup>2</sup> .....	24.00 about	24.00 about
<b>South America</b>		
Montevideo.....	23.40@24.00	23.40 about
Buenos Aires.....	23.40@24.00	23.40 about
Rosario.....	25.20@27.60	25.20@26.40
Rio Janeiro.....	19.00 about	19.00 about
Santos.....	20.00 about	20.00 about
Chile (good port).....	14.00@16.00	14.00@16.00
<b>West Indies</b>		
Havana.....	4.75 about	4.75 about
Cardenas, Sagua.....	6.50 about	6.50 about
Cienfuegos.....	6.50@6.75	6.50@6.75
Port au Spain.....	10.00 about	10.00 about
St. Lucia.....	10.00 about	10.00 about
St. Thomas.....	8.00@9.00	8.00@9.00
Barbados.....	10.00 about	10.00 about
Kingston.....	7.50 about	7.50 about
Curacao <sup>1</sup> .....	8.00@8.50	9.00 about
Santiago.....	6.75 about	6.75 about
Guantanamo.....	6.75 about	6.75 about
Bermuda.....	7.00@8.00	8.00 about
<b>Mexico</b>		
Vera Cruz.....	8.50@9.00	8.50@9.00
Tampico.....	8.50@9.00	8.50@9.00

\* Spanish dues for account of cargo. <sup>1</sup> And p.e. <sup>2</sup> Or other good Spanish port. <sup>3</sup> Net.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

#### VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

#### PHILADELPHIA

Name	Destination	Tons
Ordunte Mendi	Buenos Aires	2,435
Plencia	Sagunto	
Orkild	Havana	
Skulda	Havana	
Theodor	Patras or Piraeus	
Eika III	Gibara	
Ulrik Holm	Antilla	
Frednes	Manati	
Absalom	Antilla	
Rodfaxe	Havana	
Ellen	Marseilles	

### Ohio Valley

#### BUFFALO

Situation a little better. Coal still scarce, but cars are more plentiful and the weather is favorable. Prices as stiff as ever.

**Bituminous**—The demand is still as strong as ever, but the weather has favored the movement of cars, so that embargoes are not so general as a week ago. Shippers are now reporting limited amounts of coal in hand, when they had practically none last week. For some days the situation was worse than it had been previously. The railroads were short of men, motive power and cars, while their tracks were overrun with empty cars of classes that they did not need. The situation came to such a pass that some of the large manufacturing establishments offered to turn out a force of men to clear the tracks of snow in order to get certain cars of coal moving. There is not as yet much choice as to size or quality of coal available, but quotations at least mean more than they did a week ago.

Pittsburgh is this week asking \$7 gross for three-quarter, and allowing for not always getting this maximum the quotations will run about as follows:

Youghiogheny Gas.....	\$6.50@7.00
Pittsburgh Steam.....	6.25@6.75
Ohio No. 8.....	6.25@6.75
Allegheny Valley.....	6.00@6.50
Cambria Co. Smthing.....	6.20@6.50
Pennsylvania Smokeless.....	6.15@6.65
All Slack.....	5.75@6.25
Cannel.....	5.90@6.40

All quotations are per net ton, f.o.b. Buffalo and the bridges to Canada.

**Anthracite**—At one time recently shippers and retailers reported that they were more nearly out of a supply than they had been since winter set in. Consumers who had bought early and supposed they were fully supplied were dis-

covering that the hard winter had used up their stock and they were obliged to come back for more. At the same time several of the larger companies about ran out of everything, leaving the burden to one or two. This week the supply is better and the scare is over for the present.

At the same time the shortage at points westward and northward of this city is as great as ever. One big shipping company, which has kept its end up with the best, reported late last week that it was over 5000 cars short of its orders and was not in a way to gain on them much right away. Should it prove that the backbone of the winter is broken the shortage will slowly decrease from this time on. Meanwhile the popular mind is not so excited as it was a month ago. This section has had continuous winter, most of it very severe, since Dec. 9, or for over 12 weeks. Not since 1880 has there been such a winter.

#### TORONTO, CAN.

Conditions improving with milder weather. Shipments moving more freely. Bituminous remains scarce and prices high.

Trade conditions are improving with milder weather which enables shipments of coal to be moved more freely, and all danger of a serious famine is now considered over. The larger dealers have resumed taking orders, though local deliveries are still slow. Bituminous continues scarce, and manufacturers are largely dependent on supplies in small lots.

Prices are steadier quotations being as follows for best grades per short ton: Retail anthracite egg, stove and nut, \$9.50; grate, \$9.25; pea, \$8; bituminous steam, \$15; slack, \$18; domestic lump, \$10; cannel, \$10. Wholesale f.o.b. cars at destination, bituminous three-quarter lump, \$12; slack, \$12.

#### PITTSBURGH

Steel Corporation withdraws from market, but only gas coal definitely declines. Car supplies very poor.

Expectations were entertained that this week would see a distinctly easier spot coal market, as it was quietly circulated late last week that the Steel Corporation would withdraw from the market at the end of the week and that the support of its buying would be lacking on Monday. It was thought that some other buyers among the steel interests would also withdraw, not necessarily because they were again supplied with all the coal they needed, but perhaps as a temporary move to depress the market. Throughout this period of high spot prices there has been more or less maneuvering on the part of the large buyers, otherwise it is thought prices would have reached still higher levels.

The week opened, however, with very poor car supplies, almost as light as at any time, and the only definite decline was in gas coal, which has been off 25¢. Steam coal is a shade easier, but is not quotably lower. The Steel Corporation has not been buying but it is not clear yet whether any other large consumers have also withdrawn.

The contract market has become almost stagnant. Views of sellers are as formerly, \$3@3.25 for steam mine-run, but consumers are almost a unit in refusing to contract. If they had the opportunity to contract for shorter periods than a year, say for three or six months, they would undoubtedly be more interested.

We quote spot coal at \$5@5.25 for slack, \$5.25@5.50 for steam mine-run and \$5.75@6 for ¾-in. gas, and contract at \$3@3.25 for steam mine-run and \$3.25@3.50 for ¾-in. gas, all per net ton f.o.b. mine, Pittsburgh district.

#### DETROIT

Continuance of moderate temperature with freer movement affords some relief of shortage. Lake shippers are seeking vessel tonnage.

Bituminous—Efforts of the railroads to relieve the congestion of freight on local terminal tracks have been facilitated by moderate temperatures to such a degree that considerable improvement is reported. Practically all of the dealers have obtained a car or more during the week. In some instances the coal received constitutes the yard's only supply.

Though a better supply is on hand, there is said to have been no reduction in prices and coal of all descriptions carries a quotation of about \$5.25 at the mines. Sales are reported to have been made at \$5.50. Demand from consumers of steam coal continues active and the buyers are not inclined to be critical as to whether the coal is fine or coarse. The Detroit Edison Co., which for nearly a month has been facing the possibility of being compelled to cut off power supply of its industrial customers announces that, it now believes it will be able to obtain sufficient coal to make such a course unnecessary.

Anthracite—Receipts of anthracite continue light. Under present conditions the quantity arriving appears to provide for immediate needs. Retail prices range from \$10.50 to \$12 a ton in some parts of the city.

Lake Trade—Inquiry is still being made for vessel tonnage by Lake shippers. No recent contracts have been made public but it is known that several shippers have arranged for the movement of large tonnages. In a few instances contracts have been made extending over a period of years, the business to be handled on the basis of the going rate each season.

#### COLUMBUS

Better weather has made the railroad congestion less severe and the movement is better.

Buying is active and with short stocks prevailing, prices continue at high levels. The railroad congestion is still bad and coal shipments are delayed at junction points. Any permanent relief is not hoped for and coal men see high prices and strenuous conditions in the future.

Retailers have less demand because of the passing of the zero weather and have almost caught up with their orders. Stocks are still light but are generally sufficient for the present and prices are firm.

The steam trade is active and some shortage has developed in the northern part of the state. Confiscation of coal has been resorted to by public institutions and utilities concerns. In some cases city officials have also confiscated coal because of shortage among dealers. Premiums are being paid where delivery can be made promptly.

With congestion relieved to a certain extent on some lines, production has been larger than formerly. Little contracting is reported because of the generally unsettled condition of prices. Quite a few inquiries have been received and in many cases quotations are given, but the price is usually too high for the large user to enter into an agreement. One company has contracted for a large amount of No. 8 slack to extend over the year at \$2.50. For mine-run operators are asking from \$3.25 to \$3.50 and will not agree to furnish coal at that price longer than during the summer. Railroads are showing a disposition to get prices but when \$3 is quoted for mine-run or other steam grades they are loath to sign up. It is generally presumed that the railroads will take their chances buying from the open market during the early part of the spring at least.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomerooy	Eastern Ohio
Rescreened lump.....	\$4.75	\$5.00	
Inch and a quarter.....	4.75	5.00	\$5.00
Three-quarter inch.....	4.75	5.00	5.00
Nut.....	4.75	5.00	5.00
Egg.....	4.75	5.00	
Mine run.....	4.75	4.75	4.75
Nut, pea and slack.....	4.50	4.75	4.75
Coarse slack.....	4.50	4.75	4.75

#### CINCINNATI

Mild weather has averted danger of severe shortage, but market remains very strong. Contracting active at record prices. Cars still scarce.

A week of much milder weather has served to give the Cincinnati trade a chance to accumulate some surplus stocks. However, there is still very little coal in the city, as the transportation situation remains extremely bad, on account of congestion and the limited car supply. Large consumers are pressing for contracts more urgently than ever, having come to the conclusion that coal will be scarce and high for some time. Pocahontas contract prices are around circular quotations for the current period, and the same is true, generally of both West Virginia and Kentucky bituminous grades. Domestic prices have been advanced by retailers a dollar a ton for all grades, on account of the scarcity of coal in retail yards.

#### LOUISVILLE

Recurrent car shortage but demand continues large and market strong in spite of moderate temperatures.

Following several days of a freer car supply the first of the week, attributed to equalizing efforts covering the various fields, the scarcity again became sharply manifested at the end of the week, some of the mines such as those on the Illinois Central in western Kentucky reporting no cars at all on Friday. The 50% supply continues to be the average. Operators are much concerned in the wide efforts being made to relieve the congestion, expecting that they will benefit. A strong demand on all sides continues, with the public utility companies in the north central states especially insistent on obtaining supplies.

Consensus of opinion is that new contracts will be on the basis of \$2.25@3 for mine-run eastern and southeastern Kentucky coals. It is not expected that any contracts will be closed between now and the middle of March.

Eastern Kentucky quotes lump and block around \$4.50; mine-run, \$4.25@4.50; nut and slack, \$4.50. Western Kentucky quotations on lump have risen to \$3.25; mine-run \$2.50@3, and nut and slack \$2, the market offering practically none of the last two. All prices are f.o.b. the mines.

#### BIRMINGHAM

Prices hold firm, with little change in general conditions affecting the market. Urgent demand for deliveries, while operators are still seriously handicapped by shortage of labor and cars.

Inquiries for steam coal continue to come in in fair volume, though some sources report a slight slackening in the demand in the past few days, which is considered of only temporary character. Perhaps the urgent demands being made on the mines for deliveries of coal sold has been the more

important feature of the market, operators not being able to comply with shipping schedules on account of inability to get cars, and there is still a serious coal shortage at many of the industries in Southern territory.

Business is still confined principally to spot sales, only a few small contracts having been closed during the past week. Prices remain firm and are about as follows on the steam grades per net ton mines: Big Seam mine-run, \$2.50@3; Pratt and Black Creek, \$3.50@4; Carbon Hill, \$3.50@3.50. Domestic inquiries are only fair, with the lower grades of lump quoted at \$3.50; medium grades, \$3.75@4, and the best lump at \$4.50@4.75, all per net ton f.o.b. mines.

## Coke

#### CONNELLSVILLE

Car supplies very poor, especially box. Spot prices still higher on foundry.

Car supplies in the Connellsville coke region have been very poor this week, there being hardly any box cars and nothing like an adequate supply of open top cars. The trade is distinctly disappointed, as last week opened with a better supply than for many weeks, and while supplies became very poor toward the close of the week, down to 20 per cent. in some instances, it was expected that this week would make another good start. The scarcity of box cars is particularly acute and is probably due to the return of so many box cars to the West, under country-wide orders to the effect that box cars must return to their owners. There is even a report that orders are to be issued that box cars cannot be loaded with coke at all. A great deal of foundry coke has lately been shipped in open-top cars.

Furnace coke for spot shipment is as high as at any time in this movement, while foundry coke is at a new high record, and some in the trade expect still higher prices to come in the near future.

Two blast furnaces, Scottdale and one of the Josephine stacks, were scheduled to be blown in a fortnight ago, having been relined, but they are still out, as coke could not be secured, even though some coke was under contract. There has been a slight reduction, however, in the number of furnaces banked temporarily for lack of coke. The market is quotable about as follows: Spot furnace, \$12@13; spot foundry, \$14@15; contract furnace, nominal, \$6@8.50; foundry, nominal, \$8@8.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Feb. 17 at 306,624 tons, an increase of 4691 tons, and shipments at 289,774 tons, a decrease of 1392 tons.

Buffalo—The supply is so small that even shippers in the closest touch of the ovens or with ovens of their own are unable to fill orders with any certainty. The reason is both on account of car shortage and lack of men at the ovens, while the demand keeps up unabated and promises to continue. Quotations are on the basis of \$15 for best Connellsville foundry, f.o.b. Buffalo, net tons.

Chicago—The coke situation continues to be a troublesome one, with demands on the producers greatly in excess of output. Byproduct ovens are finding themselves increasingly short of coal supplies. A few spot sales have been made around \$13. Receipts of Eastern foundry coke are light. Furnace is particularly wanted, but few shippers are quoting prices.

Birmingham—The local coke market is featured by a demand largely in excess of the production, and it is reported that high-grade foundry was recently sold above the \$12 mark. However, \$11 and \$12 per net ton ovens are the ruling quotations on spot foundry, and \$9 to \$10 per ton for contract business. It is reported that a producer closed with an old customer for a large tonnage at \$8.50 per ton. It is understood that furnace coke would readily bring around \$7 to \$7.50 per net ton ovens, though no free coke of this grade is available.

## Middle Western

#### GENERAL REVIEW

Prices firm and supplies very short. West almost bare of Eastern coals. Contracting lags.

While weather conditions have moderated somewhat, no improvement appears to have developed in the movement of coal. All Western markets continue very strong, although prices have not materially changed. Jobbers have been able to sell all the free coal available, in some cases the coarse sizes bringing unheard of premium figures. A scarcity of domestic sizes seems to prevail, with more screenings and mine-run available, although in no case is the supply equal to the demand.

Blocked railroad yards and car shortages have resulted in a number of manufacturing plants closing down through lack of coal. A recurrence of extremely cold weather undoubtedly would impose serious suffering on many domestic consumers, and probably cut off entirely



Operators and wholesalers continue holding off on new contracts but railroads and large industrial consumers are eager to cover their needs for next year. Steam plants have been asked to pay from 75 to 100% increase in price, and the railroads in every case are being asked from 50c. to 75c. per ton more than last year.

## General Statistics

### BALTIMORE & OHIO R.R.

The following coal and coke tonnage was moved over the Baltimore & Ohio R.R. and affiliated lines during the months of January and December, 1915-16-17:

	December 1916	1915	January 1917	1916
Coal.....	2,606,773	2,805,803	2,814,321	2,703,264
Coke.....	309,791	377,511	290,986	382,692
Total....	2,916,564	3,184,314	3,105,307	3,085,956

### EXPORTS BY DISTRICTS

Exports of domestic coal and coke from the United States and bunker coal laden on vessels engaged in the foreign trade, at the specified districts, during the month of December, 1916, were as follows:

Districts	Anthracite	Bituminous	Coke
Maine and N. Hamp.	323		
Vermont.....	343	1,313	
Massachusetts.....	186	101	
St. Lawrence.....	65,033	86,651	1,825
Rochester.....	5,695	44,879	620
Buffalo.....	211,756	290,575	36,857
New York.....	9,474	4,430	1,751
Philadelphia.....	3,748	93,571	161
Maryland.....	100	49,461	15,761
Virginia.....		325,793	2,176
Florida.....	1,012		
Mobile.....		179	
New Orleans.....	1	055	5
Sabine.....			2
Galveston.....	9		
Laredo.....		2,981	607
El Paso.....		2,002	
Eagle Pass.....		2,245	32
Arizona.....		2,620	14,542
So. California.....	3	5	
San Francisco.....		1,646	4,523
Washington.....		1	5
Alaska.....			
Dakota.....	937	5,076	850
Duluth and Superior..	683	7,933	19
Michigan.....	10	58,686	8,457
Ohio.....	65	255,675	13,540
Porto Rico.....		162	
Total.....	299,379	1,236,955	101,728
Bunker Coal			
Maryland.....			30,582
New York.....			267,104
Philadelphia.....			32,428
Virginia.....			162,408

### PENNSYLVANIA RAILROAD

Statement coal and coke carried on the Pennsylvania R.R. Lines east of Pittsburgh and Erie for the month of January, 1917, as compared with December was as follows in short tons:

	January	Decrease
Anthracite.....	982,249	154,629
Bituminous.....	4,259,039	55,767
Coke.....	1,078,911	112,821
Total.....	6,320,199	323,217

## Foreign Markets

### GREAT BRITAIN

Feb. 15.—The coal market is exceedingly quiet in all branches. Buyers of spot coal can command cheaper prices. Those quoted are merely nominal.

Best Welsh steam.....	Nominal
Best seconds.....	Nominal
Seconds.....	\$6 00@6.24
Best dry coals.....	5.76@6.00
Best Monmouthshires.....	6.00@6.24
Seconds.....	5.52@5.76
Best Cardiff smalls.....	4.00@4.32
Cargo smalls.....	3.60@3.84

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

**Freights**—Tonnage is still very scarce and rates are very firm. Gibraltar has been added to the list of limitation ports which are marked (\*). Rates to other limitation ports have been largely increased.

Gibraltar.....	*\$16.80	Port Said.....	\$20.40
Marseilles.....	*21.00	Las Palmas.....	9.60
Genoa.....	*24.30	St. Vincent.....	16.80
Naples.....	*23.58	River Plate.....	16.80
Alexandria.....	20.40		

## Financial Department

### Lehigh Coal & Navigation Co.

This company reports under date of Feb. 14 for the year ended Dec. 31, 1916, as follows:

**Results**—Market conditions were generally favorable and during the last few months the demand for coal exceeded the current production. In consequence the coal we held in stock on Jan. 1, 1916—about 500,000 tons—was shipped to market. The total sales amounted to 3,939,723 tons, an increase of 355,980 tons. The net revenue derived from coal during the year amounted to \$1,110,035, an increase of \$337,928, the increased revenue being derived from the sale of coal mined in previous years and held in stock.

The year was one of abnormal industrial conditions and unusual difficulties occurred in the operation of anthracite collieries, due to the higher cost and the unrest of labor, as well as to the largely increased cost of supplies of all kinds, combined with a resulting decrease in daily capacity. These circumstances, together with the persistent demand for coal, especially during the latter months of the year, and the congested transportation facilities in certain sections, required the continuous and patient efforts of operating officials—harassed as they were by investigations, both State and Federal.

**Production**—While the commercial production per hour increased 60 tons, the total commercial production decreased 164,737 tons, the breaker-hours worked being 1890 less than in 1915, due principally to the substitution of an eight-hour day for a nine-hour day, under the provisions of the new agreement with the mine employees, which was signed on May 5, 1916. This new agreement provides for a substantial increase in rates of wages, and is effective from April 1, 1916, until Mar. 31, 1920. Operation of the mines under the new agreement was unsatisfactory, in spite of the favorable market conditions, on account of the objections by the employees to a full compliance with the terms of the eight-hour working day, as defined in the agreement, which caused interruptions in the working time of the collieries. Operation was further handicapped by "button strikes," by heavy rains in July and by the drain on the local supply of labor offered by munition and other industrial works.

The sinking of new shafts at Coaldale, Greenwood and Tamaqua collieries was completed during the year, and the development work in connection with them is now being pushed as vigorously as the scarcity of labor permits. Coaldale washery, being obsolete, was abandoned, and the construction of a new washery, to be known as Ashton washery, was begun, primarily to prepare for market 2,500,000 tons of bank coal east of Coaldale breaker.

During the year stripping operations under contract at the Summit Hill fire barrier and elsewhere on your property amounted to \$303,357. Capital expenditures for additions and betterments amounted to \$622,665, and in addition \$386,730 was expended for extraordinary underground developments and improvements and charged against operation. The charges for depletion, depreciation and other reserves amounted to \$969,397. Reserve accounts were charged \$378,084 to cover abandoned property.

**Acquisition**—We have purchased the securities of the Alliance Coal Mining Co., held by outside interests, and now own all outstanding securities.

**Bonds**—Of the consolidated mortgage sinking fund gold bonds, \$921,000 were issued during the year. There were retired and cancelled: (a) \$921,000 collateral trust gold bonds of 1910; (b)

\$112,000 consolidated mortgage sinking fund bonds; (c) \$15,000 funding and improvement mortgage bonds.

**Lehigh Navigation Electric Co.**—This company continued to expand its business. The maximum hourly demand on its plant was 24,100 kw., an increase of 6700 kw. On Dec. 31, 1916, there were 112 customers taking current from the Hauto plant, an increase of 37. The number of kilowatt hours sold during the year was 112,282,773, an increase of 19,10%. In the operation of the Hauto plant there was used a total of 213,481 tons of small coal, which was purchased from your company. The total operating revenue of the Electric Co. from its Hauto plant for the year was \$828,623, the net revenue \$350,755, and the net income, after deducting all taxes, interest, fixed charges, etc., \$75,687. No depreciation charge has been made as yet.

**Litigation**—The proceedings against your company on account of sums received by it as additional rental under agreement of Mar. 31, 1871, whereby the Lehigh & Susquehanna R.R. was leased to the Central R.R. Co. of N. J., resulted in the imposition of a fine of \$100,000. An appeal to the Circuit Court of Appeals is pending.

The appeal in the suit of the United States against the Reading Co. and others (including your company), for the purpose of preventing the defendants from continuing alleged violations of the Anti-Trust Act of 1890 and the Commodities clause of the L-S. C. Act, is still pending in the U. S. Supreme Court.

**Purchase**—On July 1 your company purchased from A. Pardee & Co. their leasehold in Cranberry colliery, located at Hazleton, Pa. The lease has been extended to July 1, 1936 and extensive improvements, including electrification and remodeling the breaker, were undertaken. The commercial production amounted to 189,067 tons between July 1 and Dec. 31.

### BALANCE SHEET DEC. 31.

Assets	1916	1915
Coal lands, etc.....	\$18,555,989	\$18,254,996
Canal property.....	\$3,388,452	\$3,397,148
Real estate.....	1,067,950	1,066,616
Physical property.....	16,783,894	16,048,776
Securities pledged.....	11,354,080	12,969,911
Securities unpledged.....	4,317,357	3,641,670
Co.'s secur. pledged.....	2,105,000	2,199,000
Bds., etc., in treasury.....	x1,018,700	1,845,700
Cash.....	4,269,507	1,964,291
Customers' acc'ts.....	1,812,288	2,294,636
Coal stock.....	225,471	1,722,373
Materials and supplies.....	655,563	356,092
Sundry debtors.....	668,524	416,084
Miscellaneous.....	10,098	4,158
Compensation fund.....	122,615	
Susp. deb. items.....	1,132,415	1,111,230
Total.....	\$67,487,905	\$67,292,681
Liabilities	1916	1915
Capital stock.....	\$26,587,650	\$26,587,650
Funded debt.....	30,074,000	30,533,000
Audited vouchers and pay-rolls.....	1,079,179	1,452,761
Sundry creditors.....	24,257	35,406
Matured bond interest.....	427,168	397,334
Accrued taxes.....	856,047	845,010
Accrued bond interest.....	46,706	53,614
Matured and accrued rents	2,836	2,906
Divs. unclaimed.....	8,876	6,369
Susp. credit items.....	16,162	402,926
Depreciation, etc., res'v's..	4,790,319	4,205,768
Reserve for workman's compensation.....	122,615	
Profit and loss.....	y3,452,091	2,769,937
Total.....	\$67,487,905	\$67,292,681

a Includes Delaware Division Canal Co., of Penna stock and bonds pledged of a book value of \$1,047,335 x Includes in 1916 stocks in treasury, \$29,700, and bonds in treasury, \$989,000. y After adding sundry accounts adjusted, \$18,443.

### PRODUCTION OF COAL BY YOUR COMPANY AND ITS TENANTS

(All in Gross Tons)	By Company	By Lessees	Total Both
	1916	1915	1916 1915
Mined.....	3,519,432	3,788,628	263,862 195,887
Recovered from culm banks.....	302,734	306,034	1,401 2,840
Total produced.....	3,822,166	4,094,662	265,263 198,727
Fuel coal.....	391,538	499,297	41,442 27,440
Comm'l coal produced.....	3,430,628	3,595,365	223,821 171,287

### RESULTS FOR CALENDAR YEARS

	1916—Gross—1915	1916—Net—1915
Coal.....	\$14,068,471	\$12,062,681
Canals.....	164,339	196,366
Railroad rentals received.....	2,270,184	2,293,611
Investments.....	961,142	1,060,876
Miscellaneous.....	*831,169	181,468
Total.....	\$18,295,304	\$15,795,002
General administrative expenses.....		\$134,881
General taxes.....		336,205
Interest on funded debt.....		1,181,758
Other interest.....		78
Amortization of debt, discount, etc.....		9,646
Dividends paid (8%).....		2,124,636
Balance, surplus.....		\$663,712

\* Includes operation of Cranberry leasehold.